

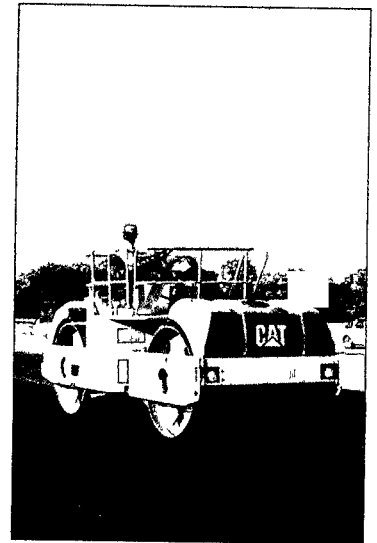
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SPS-1

Sampling and Testing Plan

SPS-1 Experimental Project

STH 29 Westbound



Prepared by:
SHRP North Central Region

Summer 1997



Submitted by

ERES
CONSULTANTS, INC.

**SAMPLING AND TESTING PLAN
SPS-1 EXPERIMENTAL PROJECT
STH 29
MARATHON COUNTY, WISCONSIN**

Strategic Highway Research Program
Long-Term Pavement Performance
Specific Pavement Studies

Prepared by
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Updated July 15, 1997

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1.0 INTRODUCTION

The SHRP experimental project SPS-1, "Strategic Study of Structural Factors for Flexible Pavements," investigates the effect of selected structural factors on the long-term performance of flexible pavements. The structural factors considered include surface layer thickness, base type (material), drainability (permeability), and base course thickness. In this experiment, 12 test sections are constructed. Field tests are conducted and samples obtained from the outer (right) lane at different stages of construction. The purpose of the sampling and testing activities is to document the conditions of the as-built pavement layers.

An SPS-1 experiment is planned for construction on westbound STH 29 in Marathon County, Wisconsin. Most of the sections are reconstruction of an existing pavement, although some sections contain portions that are new construction. The SPS-1 project is part of a larger experimental project that also includes SPS-2, SPS-8, and SPS-9A projects.

This document presents the type, number, and locations for the sampling and testing activities at different stages of construction on all 12 test sections. In addition, it contains details of the laboratory tests to be conducted on the samples. The laboratory tests shall be performed by the Wisconsin DOT laboratory or their designee(s) and the FHWA-LTPP Laboratory Materials Testing Contractor. Further details of the SPS-1 experiment, materials sampling procedures, and laboratory testing procedures are given in References 1 through 5.

This is a working document. As situations are encountered in the field during construction, it may be necessary to augment parts of this sampling plan. For instance, sampling locations may be moved slightly in either the transverse or longitudinal direction. However, it is essential that any changes made to this plan, even slight ones, be documented carefully for future reference.

2.0 LAYOUT OF TEST SECTIONS

The layout of the 12 test sections included in the SPS-1 experimental project is shown in figure 1. This figure shows the monitoring portion of each test section, which is 500 ft in length. Tables 1 and 2 provide the layer coding and numbering schemes for the SPS-1 experiment. Table 3 gives the section limits for all test sections. Each test section includes a monitoring section of 500 ft and 50 ft at each end of the monitoring section to be used as sampling areas. The pavement layer materials and thicknesses for all sections are shown in table 4.

3.0 MATERIALS SAMPLING AND TESTING

Materials sampling and field testing are required at different stages of construction. These activities shall be conducted according to the standards specified or referenced in this document. The standards may be specific to the SHRP-LTPP program or standard AASHTO/ASTM methods. LTPP sampling and field testing procedures have been developed specifically for the SHRP program and are described in reference 2. In addition, protocols have been developed by SHRP for conducting laboratory tests. These protocols are documented in appendix E.2 of the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1).

Sampling and field testing shall commence from the prepared surface of the remaining portion of the existing base or subbase, from the subgrade, or from the embankment layer, depending on the test section. A summary of the samples to be obtained and field tests to be performed on all layers are described next.

3.1 Subgrade

- Conduct deflection testing using a Falling Weight Deflectometer (FWD) along the outer wheelpath of the existing pavement prior to removal.
- Obtain splitspoon samples.
- Obtain bulk samples and moisture samples.
- Conduct moisture and density tests using the nuclear gauge on the prepared subgrade surface at bulk sampling locations prior to sampling.

3.2 Embankment

- Conduct moisture and density tests using the nuclear gauge on the prepared embankment surface.
- Obtain bulk samples and moisture samples from the prepared embankment surface.
- Conduct elevation measurements on the prepared embankment surface in section 550113.

3.3 Existing Subbase

- Obtain bulk samples and moisture samples from the prepared subbase surface.

- Conduct moisture and density tests using the nuclear gauge on the prepared subbase surface.
- Conduct elevation measurements on the prepared subbase surface in sections 550121, 550124, 550123, and 550114.

3.4 Existing Crushed Rock Base

- Obtain bulk samples and moisture samples from the prepared crushed rock base surface.
- Conduct moisture and density tests using the nuclear gauge on the prepared crushed rock base surface.
- Conduct elevation measurements on the prepared crushed rock base surface in sections 550116, 550118, 550122, 550120, 550119, 550115, and 550117.

3.5 Dense Graded Aggregate Base (DGAB)

- Conduct nuclear moisture and density tests on compacted aggregate base using the nuclear gauge.
- Obtain bulk samples and moisture samples from the compacted aggregate base.
- Conduct elevation measurements on the compacted aggregate base surface.

3.6 Permeable Asphalt Treated Base (PATB)

- Obtain bulk samples of uncompacted permeable asphalt treated base material from the paver or the haul vehicle immediately prior to laydown.
- Conduct elevation measurements on the prepared surface of the permeable asphalt treated base.

3.7 Asphalt Treated Base (ATB)

- Obtain bulk samples of uncompacted asphalt treated base material from the paver or haul vehicle immediately prior to laydown.
- Conduct nuclear density tests on the compacted asphalt treated base.

- Conduct elevation measurements on the prepared surface.
- Obtain cores from the asphalt treated base layer (performed concurrently with coring of AC layers).

3.8 Asphalt Concrete (AC)

- Obtain bulk samples of uncompacted asphalt concrete from the paver or haul vehicle immediately prior to laydown. Samples from the intermediate course and the surface course are required.
- Obtain from the plant bulk samples of asphalt cement used in the asphalt concrete.
- Conduct nuclear density tests on the compacted asphalt concrete intermediate course and the surface course.
- Conduct elevation measurements on the finished AC surface.
- Obtain cores from asphalt concrete layer.

3.9 Samples for Long-Term Storage

- Obtain samples of the different types of asphalt cement used for asphalt-based layers.
- Obtain bulk samples of the graded coarse and fine aggregate used for all asphalt-based layers except the permeable asphalt treated base.
- Obtain bulk samples of the uncompacted mix from all asphalt-based layers.

The material sampling requirements for the test sections are summarized in table 5A. Table 5B gives the samples that are required for the LTPP Materials Reference Library. The sampling requirements for the LTPP Materials Reference Library are described in section 5.10 of this report.

A summary of the field tests that are to be conducted on each layer is presented in table 6. The laboratory tests to be conducted on the subgrade, embankment, existing subbase, existing crushed rock base, aggregate base, permeable asphalt treated base, asphalt treated base, and asphalt concrete material are given in table 7. This table also gives the SHRP test designations and the SHRP protocols for all tests.

The detailed plan for sampling and field testing showing the sampling and field test locations, as well as the detailed laboratory testing plan which allocates samples for each laboratory test, will be described in the next sections.

4.0 OVERVIEW OF SAMPLING AND TESTING PLAN

Figure 2 provides an overview of the layer types and thicknesses in all sections. An overview of the sampling and field testing requirements for the different pavement layers for all sections are shown in figures 3 through 10. Elevation measurements shall be conducted on all layers. All sampling and field testing in each layer shall be completed before construction begins on the next layer. Locations for field tests and sampling in these figures are specified according to the construction stationing.

5.0 SAMPLING AND TESTING FOR EACH LAYER

5.1 Introduction

Sampling, field tests, and laboratory tests for each pavement layer will be described in this section. Refer to figures 3 through 10 for an overview of the sampling and testing to be performed on each pavement layer. All sampling and field tests shall be conducted according to the specified standards for sampling and testing. These standards are either AASHTO standards, ASTM standards, or methods specific to the SHRP program. All laboratory tests shall be conducted according to protocols developed for the SPS-1 experiment that are in appendix E.2 of the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1).

The laboratory tests specified in this document shall be conducted by Wisconsin DOT or a Wisconsin DOT-designated laboratory and by the FHWA-LTPP Materials Testing Contractor. Tables 36 through 53 detail what samples are shipped to each laboratory and what tests are performed on individual samples. Sampling, field testing, and laboratory testing for each layer are described in the next sections. The offsets for sampling and testing locations in the tables in this sampling plan are distances from the center line of the pavement.

5.2 Subgrade

5.2.1 Sampling

Bulk samples and moisture samples from the subgrade shall be obtained from the test sections at the locations shown in table 8. Prior to obtaining bulk samples at these

locations, nuclear moisture/density testing shall be conducted at the sampling locations. The bulk sampling shall consist of a single excavation, 2 ft by 2 ft in area and 12 in deep. Approximately 400 lb of material shall be obtained from each sampling location. Following procedures outlined in section 3.3.2 of reference 3, from this 400-lb sample, 100 lb shall be shipped to the State laboratory or their designee and 300 lb shall be shipped to the FHWA-LTPP Laboratory Materials Testing Contractor.

Splitspoon samples shall be obtained from the subgrade at the locations shown in table 9. Splitspoon sampling shall be performed using a 140-lb hammer, 30-in drop and a sampler specified in AASHTO T206 to a depth of 4 ft below the top of the subgrade. After performing splitspoon sampling, the barrel shall be opened and the recovered material shall be carefully examined and logged to record the length of the recovery and description of the soil. The soil layers should be identified and recorded on Sampling Data Sheet 4-1 (see appendix B in reference 3). If rock, boulders, or other forms of dense materials are encountered within four ft of the top of the layer, another attempt for sampling shall be made at a different location with a longitudinal offset of 5 to 10 ft. If refusal occurs at a second location, splitspoon sampling shall be terminated. Splitspoon samples need not be retained or shipped to the lab for further evaluation.

5.2.2 Field and Laboratory Tests

A summary of the field and laboratory test plan for the subgrade is shown in table 10. This table also gives the SHRP protocols that shall be followed when conducting these tests. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed when conducting any laboratory tests.

The following field tests shall be conducted on the subgrade surface:

1. *Density and Moisture Tests.* Locations for in-place density and moisture tests on the prepared subgrade are shown in table 11. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)," Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)." For the density test, the rod shall be imbedded 4 to 8 in below the layer surface, as appropriate, to test the full layer. At each testing location, four readings of 1 minute each shall be conducted, with the nuclear testing instrument rotated 90° between each reading.

2. *Auger Probes.* Roadway boring logs have been provided from 1993 that indicate that no rigid layer exists in the area within 20 ft of the surface. Therefore, it has been determined that no shoulder probes will be required for this project.
3. *Deflection Testing.* Deflection testing using an FWD shall be performed on the existing pavement prior to removal at all test sections.

5.3 Embankment

5.3.1 Sampling

Bulk samples and moisture samples shall be obtained from the prepared embankment surface at the locations shown in table 12. Prior to obtaining bulk samples at these locations, nuclear moisture/density testing shall be conducted at the sampling locations. Approximately 400 lb of material shall be obtained from each sampling location. The bulk sample shall consist of a single excavation, 2 ft by 2 ft in area and 12 in deep. If the depth of the embankment is less than 12 in at the sampling location, the area of the excavation shall be increased to obtain sufficient material. Following procedures outlined in section 3.3.2 of reference 3, from this 400-lb sample, 100 lb shall be shipped to the State laboratory or their designee and 300 lb shall be shipped to the FHWA-LTPP Laboratory Materials Testing Contractor.

5.3.2 Field and Laboratory Tests

A summary of the field and laboratory test plan for the embankment is shown in table 13. This table also gives the SHRP protocols that shall be followed when conducting these tests. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Materials Handling and Testing* (reference 1) shall be followed when conducting any laboratory tests.

The following field tests shall be conducted on the prepared embankment surface:

1. *Density and Moisture Tests.* Locations for in-place density and moisture measurements on the prepared embankment surface are shown in table 14. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)," Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)." For the density test, the rod shall be imbedded 4 to 8 in below the layer surface, as

appropriate, to test the full layer. At each testing location, four readings of 1 minute each shall be conducted, with the nuclear testing instrument rotated 90° between each reading.

2. *Elevation Measurements.* Elevation measurements shall be performed on the surface of the prepared embankment in section 550113. The elevation measurements shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft from the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

5.4 Existing Subbase

5.4.1 Sampling

Bulk samples and moisture samples from the prepared subbase shall be obtained from the test sections at the locations shown in table 17. Prior to obtaining bulk samples, nuclear moisture/density testing shall be conducted at the sampling locations. The bulk sampling shall consist of a single excavation, 2 ft by 2 ft in area and 10 in deep. Approximately 400 lb of material shall be obtained from each sampling location. If the thickness of the existing subbase layer is less than 10 in, the area of the excavation shall be increased so that the required sample can be obtained. Following procedures outlined in section 3.3.2 of reference 3, from this 400-lb sample, 100 lb shall be shipped to the State laboratory or their designee and 300 lb shall be shipped to the FHWA-LTPP Laboratory Material Testing Contractor.

5.4.2 Field and Laboratory Tests

A summary of the field and laboratory test plan for the existing subbase is shown in table 18. This table also gives the SHRP protocols that shall be followed when conducting these tests. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed when conducting and laboratory tests.

The following field tests shall be conducted on the prepared existing subbase:

1. *Density and Moisture Tests.* Locations for in-place density and moisture tests on the existing subbase are shown in table 19. The density/moisture measurements shall be made using direct transmission method for density and the backscatter

method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)," Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)." For the density test, the rod shall be imbedded 4 to 8 in below the layer surface, as appropriate, to test the full layer. At each testing location, four readings of 1 minute each shall be conducted, with the nuclear testing instrument rotated 90° between each reading.

2. *Elevation Measurements.* Elevation measurements shall be performed on the surface of the prepared subbase in sections 550121, 550124, 550123, and 550114. The elevation measurements shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft beyond the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

5.5 Existing Crushed Rock Base

5.5.1 Sampling

Bulk samples and moisture samples from the existing crushed rock base shall be obtained at the locations shown in table 20. Nuclear moisture and density tests shall be performed at the bulk sampling locations prior to obtaining bulk samples. The bulk sampling shall consist of a single excavation, 3 ft by 3 ft in area for section 550122 and 5 ft by 5 ft in area for sections 550117 and 550119, for the entire layer thickness. Approximately 400 lb of material shall be obtained from each sampling location. If the thickness of the existing crushed rock base layer is less than adequate to obtain the sample necessary, the area of the excavation shall be increased so that the required sample can be obtained. Following procedures outlined in section 3.3.3 of reference 3, from this 400-lb sample, a 100-lb sample shall be shipped to the State laboratory or their designee and a 300-lb sample shall be shipped to the FHWA-LTPP Laboratory Materials Testing Contractor.

5.5.2 Field and Laboratory Tests

A summary of the field and laboratory tests to be conducted on the existing crushed rock base is shown in table 21. This table also gives the SHRP protocols that shall be followed when conducting these tests. The applicable procedures outlined in the

SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (reference 1) shall be followed when conducting any laboratory tests.

The following field tests shall be conducted on the surface of the prepared crushed rock base:

1. *Density and Moisture Tests.* Locations for in-place density and moisture tests on the existing crushed rock base are shown in table 22. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)" Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)." For the density test, the rod shall be imbedded 4 to 8 in below the layer surface, as appropriate, to test the full layer. At each testing location, four readings of 1 minute each shall be conducted, with the nuclear testing instrument rotated 90° between each reading.
2. *Elevation Measurements.* Elevation measurements shall be performed on the prepared existing crushed rock base surface in sections 550116, 550118, 550122, 550120, 550119, 550115, and 550117. Elevation measurements shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft beyond the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15.

5.6 Dense Graded Aggregate Base

5.6.1 Sampling

Bulk samples and moisture samples from the compacted aggregate base shall be obtained at the locations shown in table 23. Nuclear moisture and density tests shall be performed at the bulk sampling locations prior to obtaining bulk samples. Each bulk sample shall contain 400 lb of material. Following procedures outlined in section 3.3.3 of reference 3, from this 400-lb sample, a 100-lb sample shall be shipped to the State laboratory or their designee and a 300-lb sample shall be shipped to the FHWA-LTPP Laboratory Materials Testing Contractor.

5.6.2 Field and Laboratory Tests

A summary of the field and laboratory tests to be conducted on the aggregate base is shown in table 24. This table also gives the SHRP protocols that shall be followed when conducting these tests. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed when conducting any laboratory tests.

The following field tests shall be conducted on the prepared aggregate base surface:

1. *Density and Moisture Tests.* Locations for in-place density and moisture tests on the prepared aggregate base are shown in table 25. The density/moisture measurements shall be made using direct transmission method for density and the backscatter method for moisture determination. Density determinations shall be conducted using AASHTO T238-86, "Standard Method for Density of Soil and Soil Aggregate in Place by Nuclear Method (Shallow Depth)" Method B - Direct Transmission. Moisture measurements shall be conducted using AASHTO T239-86, "Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depths, Backscatter Method)." For the density test, the rod shall be imbedded 4 to 8 in below the layer surface, as appropriate, to test the full layer. At each testing location, four readings of 1 minute each shall be conducted, with the nuclear testing instrument rotated 90° between each reading.
2. *Elevation Measurements.* Elevation measurements shall be performed on all test sections that contain an aggregate base. Elevation measurements on the prepared aggregate base shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft from the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15.

5.7 Permeable Asphalt Treated Base

5.7.1. Sampling

Bulk samples of uncompacted permeable asphalt treated base (PATB) material shall be obtained from the haul vehicle or the paver. The samples shall be obtained from the mix that is to be placed at the locations shown in table 26. Each sample shall contain 100 lb of material. These samples shall be obtained in accordance with AASHTO T168.

5.7.2. Field and Laboratory Tests

A summary of the field tests to be conducted on the prepared PATB surface and laboratory tests to be conducted on the uncompacted PATB samples is shown in table 27. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed when conducting any laboratory tests.

The following field test shall be conducted on the prepared PATB surface.

1. *Elevation Measurements.* Elevation measurements shall be performed on all test sections having a PATB layer. The elevation measurements shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft beyond the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

5.8 Asphalt Treated Base

5.8.1. Sampling

Bulk Samples

Bulk samples of uncompacted asphalt treated base (ATB) material shall be obtained from the haul vehicle or the paver. The samples shall be obtained from the mix that is to be placed at the locations shown in table 28. Each sample shall contain 200 lb of material. These samples shall be obtained in accordance with AASHTO T168 and shipped to the laboratory.

Core Samples

Cores 4 inches in diameter shall be obtained from the asphalt treated base at the same time that cores are obtained from the asphalt concrete surface. The locations at which cores from the ATB shall be obtained are shown in table 29. The direction of traffic shall be marked on all cores.

5.8.2 Field and Laboratory Tests

The laboratory testing plan for uncompacted ATB material and cores from asphalt treated base is shown in table 30. This table also includes the field tests to be performed

on the prepared ATB surface. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed when conducting any laboratory tests. The visual examination and determination of thickness of the cores shall be performed before conducting any laboratory tests on the cores.

If the asphalt cement used in the asphalt treated base is different from that used for asphalt concrete, three 5-gallon samples of the asphalt cement shall be obtained from the plant. The tests to be performed on the asphalt cement from the plant, listed in table 34, should also be performed on these samples.

The following field tests shall be conducted on the prepared asphalt treated base surface:

1. *Nuclear Density Tests.* Nuclear density testing shall be conducted on the prepared surface of the asphalt treated base at locations specified in table 31. The density testing shall be performed at the specified locations using AASHTO T238-86, backscatter mode. Each testing location shall have four readings, with the density instrument rotated 90° between each reading.
2. *Elevation Measurements.* Elevation measurements shall be performed on all sections that contain an asphalt treated base. The elevation measurements shall be conducted on the prepared asphalt treated base at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft beyond the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

5.9 Asphalt Concrete (AC)

Two asphalt concrete mixes are used in the test section, the Type HV binder (intermediate) course and Type HV surface course.

5.9.1 Sampling

Bulk Sampling

Bulk samples of uncompacted asphalt concrete material shall be obtained from the paver or the haul vehicle from the mix that is to be placed approximately at the locations shown in table 32. At each location, samples shall be obtained from both

asphalt concrete mixes (intermediate course and surface course). Each concrete sample shall contain 200 lb of material. These samples shall be obtained in accordance with AASHTO T168 and shipped to the laboratory.

Asphalt Cement

Three 5-gallon samples of the asphalt cement that is used for the production of the asphalt concrete shall be obtained from the plant. The sampling schedule and the sample designation are given in table 32.

Core Samples

Core samples 4 inches in diameter shall be obtained from the compacted asphalt concrete surface. The locations from which the cores shall be obtained are given in table 33.

Coring operations shall be performed in accordance with AASHTO T24-86, "Obtaining and Testing Drilled Cores and Sawed Beams of Concrete." Carbide or diamond bit drilling is to be performed. Mist or air-cooled drilling is preferred as the best method to minimize water contamination of the underlying layers. If necessary, to obtain cores of suitable quality, the pavement may be cooled by dry ice or other means prior to coring. Cores of multiple layers of asphalt concrete shall not be separated in the field. Plugs shall not be inserted in cores. Suction cups or wire pulls have been successfully used for core extraction. Care shall be taken to obtain cores at a 90° angle to the pavement surface and to ensure that the edges are straight, intact, smooth, and suitable for laboratory testing. Details on tolerance and quality control of the cores are included in section 3.3.6 of reference 3. The direction of traffic shall be marked on all cores using a waterproof marking material. All cores must be dried before packaging.

5.9.2 Field and Laboratory Tests

The field tests to be conducted on the compacted asphalt concrete surface, as well as laboratory tests to be conducted on the uncompacted material and cores of asphalt concrete are shown in table 34. This table also gives the SHRP protocols that are to be followed when conducting these tests. The applicable procedures outlined in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1) shall be followed prior to conducting any laboratory tests. The visual examination and determination of thickness of the cores shall be performed before conducting any laboratory tests on the cores.

The following field tests are to be conducted on the prepared asphalt concrete surface:

1. *Nuclear Density Tests.* The locations for nuclear density tests are specified in table 35. Nuclear density tests shall be conducted after the placement of the intermediate course, as well as after the placement of the surface course. The density testing shall be performed at the specified locations using AASHTO T238-86, backscatter mode. Each testing location shall have four readings, with the density instrument rotated 90° between each reading.
2. *Elevation Measurements.* Elevation measurements shall be performed on the prepared asphalt concrete surface at all sections. The elevation measurements shall be conducted at the following locations: (1) five points across the lane at 50-ft intervals between the beginning and end of the monitoring section, and (2) five points across the lane, at 25 ft prior to the beginning of the monitoring section and 25 ft beyond the end of the monitoring section. The locations at which the elevation measurements are to be performed are given in table 15. Each elevation measurement shall be measured with an accuracy within 0.01 ft.

5.10 Samples for Long-Term Storage

The LTPP Materials Reference Library requires additional samples for long-term storage. The following samples are required for long-term storage.

1. *Asphalt Cement.* Three 5-gallon samples of asphalt cement shall be obtained from the plant for each type of asphalt cement used in the project. The asphalt-based layers that have to be considered are the two asphalt concrete layers (Type HV intermediate course and Type HV surface course), asphalt treated base, and permeable asphalt treated base. The asphalt cement shall be sampled from the plant using AASHTO T40, "Sampling Bituminous Materials," after the asphalt cement has been heated for mixing.
2. *Graded Coarse and Fine Aggregate.* One 55-gallon drum of the graded coarse and fine aggregate from the plant shall be obtained for each asphalt-based layer except the permeable asphalt treated base. This material shall be sampled in conformance with applicable portions of AASHTO T2, "Sampling Aggregates." For drum plants, the aggregates should be obtained from the charging (inclined) conveyor using the bypass chute, if possible. Otherwise, the sample should be taken from the belt on the charging conveyor. For batch plants, the aggregate can be sampled from the inclined conveyor at the dryer.

3. *Uncompacted Asphalt Mix.* Three 5-gallon pails of the finished uncompacted mix shall be obtained from each asphalt-based layer. The samples shall be obtained from the paver or the haul vehicle immediately prior to laydown. These materials shall be sampled in conformance with AASHTO T168, "Sampling Bituminous Paving Mixtures."

The containers (barrels and buckets) for the storage of the samples will be provided by the LTPP Materials Reference Library. These containers are of special manufacture to accommodate long-term storage. Containers shall be shipped by a suitable means, as agreed upon by the FHWA-LTPP Regional Engineer.

6.0 LOGS AND REPORTS

During field sampling operations, two types of forms must be completed. These are the Field Operations Information Forms and the Sampling Data Sheets. Field Operations Information Forms are used to record general information concerning the pavement test sections and the materials samples. Sampling Data Sheets are used to record the actual information for each sampling area or sampling location. If these forms are completed by a person other than the LTPP representative, the data must be reviewed by the LTPP representative prior to forwarding the sheets to the appropriate personnel. Further details are given in section 3.3.13 of reference 3. Details on assembly and transmittal of data sheets are described in section 3.3.16 of reference 3.

7.0 HANDLING AND SHIPPING OF SAMPLES

Because of the research nature of this project and because samples will be shipped over long distances, it is extremely important that the samples be packaged carefully. All samples shall be shipped within 5 days to the laboratory designated by the participating highway agency, if possible. Sections 3.3.7, 3.3.8, 3.3.9, 3.3.10, and 3.3.11 in reference 3 give detailed guidelines on packaging and shipping of samples.

8.0 SAMPLE STORAGE

The guidelines for storing materials from the LTPP experiment are described in section 4.10 in reference 3.

9.0 LABORATORY TESTING

The protocols for laboratory testing on samples are described in the *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing* (reference 1). The applicable procedures for laboratory testing that are outlined in section 4 of reference 3 shall also be followed when performing laboratory tests. Tables 36 through 53 detail what samples are shipped to each laboratory and what tests are performed on individual samples.

10.0 DOCUMENTATION

An extensive amount of documentation is required for SPS projects. It is essential that the State assign a person full-time who will be in charge of completing all necessary documentation for this project. This includes documentation related to inventory, construction, sampling, field testing, and laboratory testing.

11.0 REFERENCES

1. *SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (PCC, Bituminous Materials, Aggregates and Soils)*, Operational Guide No. SHRP-LTPP-OG-004, Strategic Highway Research Program, Revised and Amended July 1993.
2. *SHRP-LTPP Guide for Field Materials Sampling, Testing, and Handling*, Version 2.0, Operational Guide No. SHRP-LTPP-OG-0006, Strategic Highway Research Program, Revised October 1992.
3. *Specific Pavement Studies, Material Sampling and Testing Requirements for Experiment SPS-1, Strategic Study of Structural Factors for Flexible Pavements*, Federal Highway Administration, LTPP Division, January 1994.
4. *Specific Pavement Studies: Experimental Design and Research Plan for Experiment SPS-1, Strategic Study of Structural Factors for Flexible Pavements*, February 1990.
5. *Specific Pavement Studies: Construction Guidelines for Experiment SPS-1, Strategic Study of Structural Factors for Flexible Pavements*, Federal Highway Administration, December 1993.

Appendix A

Tables

Table 1. Layer Coding SPS-1.

Project Layer Code	Material Code	Comments
A	59	Subgrade
B	57	Embankment (Fill)
C	26	Existing Subbase
D	23	Existing Crushed Rock Base
E	23	Dense Graded Aggregate Base
F	74 or 75	Woven or Nonwoven Geotextile Fabric
G	31	Permeable Asphalt Treated Base
H	28	Asphalt Treated Base
I	01	Asphalt Concrete - HV Binder
J	01	Asphalt Concrete - HV Surface

Table 2. Test Section Layer Numbering SPS-1.

Test Section	Layer Number	Project Layer Code	Layer Thickness (in)	Material Code	Comments
550113	1	A	N/A	59	Subgrade
	2	B	Varies	57	Embankment (Fill)
	3	E	8.0	23	DGAB
	4	I	2.25	01	AC Binder
	5	J	1.75	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550116	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	0.75	23	Existing Crushed Rock Base
	4	H	12.0	28	ATB
	5	I	2.25	01	AC Binder
	6	J	1.75	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550118	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	0.75	23	Existing Crushed Rock Base
	4	E	4.0	23	DGAB
	5	H	8.0	28	ATB
	6	I	2.25	01	AC Binder
	7	J	1.75	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550122	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	4.75	23	Existing Crushed Rock Base
	4	F	N/A	74 or 75	Geotextile Fabric
	5	G	4.0	31	PATB
	6	H	4.0	28	ATB
	7	I	2.25	01	AC Binder
	8	J	1.75	01	AC Surface

Table 2. Test Section Layer Numbering SPS-1 (continued).

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550120	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	0.75	23	Existing Crushed Rock Base
	4	E	8.0	23	DGAB
	5	G	4.0	31	PATB
	6	I	2.25	01	AC Binder
	7	J	1.75	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550121	1	A	N/A	59	Subgrade
	2	C	6.75	26	Existing Subbase
	3	E	12.0	23	DGAB
	4	G	4.0	31	PATB
	5	I	2.25	01	AC Binder
	6	J	1.75	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550119	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	1.75	23	Existing Crushed Rock Base
	4	E	4.0	23	DGAB
	5	G	4.0	31	PATB
	6	I	5.5	01	AC Binder
	7	J	1.5	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550124	1	A	N/A	59	Subgrade
	2	C	3.75	26	Existing Subbase
	3	F	N/A	74 or 75	Geotextile Fabric
	4	G	4.0	31	PATB
	5	H	12.0	28	ATB
	6	I	5.5	01	AC Binder
	7	J	1.5	01	AC Surface

Table 2. Test Section Layer Numbering SPS-1 (continued).

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550123	1	A	N/A	59	Subgrade
	2	C	7.75	26	Existing Subbase
	3	F	N/A	74 or 75	Geotextile Fabric
	4	G	4.0	31	PATB
	5	H	8.0	28	ATB
	6	I	5.5	01	AC Binder
	7	J	1.5	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550115	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	1.75	23	Existing Crushed Rock Base
	4	H	8.0	28	ATB
	5	I	5.5	01	AC Binder
	6	J	1.5	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550117	1	A	N/A	59	Subgrade
	2	C	10.0	26	Existing Subbase
	3	D	1.75	23	Existing Crushed Rock Base
	4	E	4.0	23	DGAB
	5	H	4.0	28	ATB
	6	I	5.5	01	AC Binder
	7	J	1.5	01	AC Surface

Test Section	Layer Number	Project Layer Code	Layer Thickness	Material Code	Comments
550114	1	A	N/A	59	Subgrade
	2	C	7.75	26	Existing Subbase
	3	E	12.0	23	DGAB
	4	I	5.5	01	AC Binder
	5	J	1.5	01	AC Surface

Table 3. Limits of Test Sections - SPS-1.

Section Number	600 ft. SHRP Section		500 ft. Monitoring Section	
	Beginning	End	Beginning	End
550113	907 + 50	913 + 50	908 + 00	913 + 00
550116	914 + 50	920 + 50	915 + 00	920 + 00
550118	924 + 50	930 + 50	925 + 00	930 + 00
550122	931 + 50	937 + 50	932 + 00	937 + 00
550120	944 + 50	950 + 50	945 + 00	950 + 00
550121	951 + 50	957 + 50	952 + 00	957 + 00
550119	958 + 50	964 + 50	959 + 00	964 + 00
550124	968 + 50	974 + 50	969 + 00	974 + 00
550123	975 + 50	981 + 50	976 + 00	981 + 00
550115	984 + 50	990 + 50	985 + 00	990 + 00
550117	992 + 50	998 + 50	993 + 00	998 + 00
550114	999 + 00	1005 + 00	999 + 50	1004 + 50

Table 4. Design Features of Test Sections - SPS-1.

Test Section Number	AC Thickness (in) (Surface)	Material and Thickness (in) (Base 1)	Material and Thickness (in) (Base 2)	Edge Drains
550113	4	DGAB 8	-	No
550116	4	ATB 12	-	No
550118	4	ATB 8	DGAB 4	No
550122	4	ATB 4	PATB 4	Yes
550120	4	PATB 4	DGAB 8	Yes
550121	4	PATB 4	DGAB 12	Yes
550119	7	PATB 4	DGAB 4	Yes
550124	7	ATB 12	PATB 4	Yes
550123	7	ATB 8	PATB 4	Yes
550115	7	ATB 8	-	No
550117	7	ATB 4	DGAB 4	No
550114	7	DGAB 12	-	No
<p>NOTE: AC - Asphalt Concrete DGAB - Dense Graded Aggregate Base ATB - Asphalt Treated Base PATB - Permeable Asphalt Treated Base</p>				

Table 5A. Materials Sampling Requirements - SPS-1.

Material Sample	Number of Samples
SUBGRADE	
Bulk Samples - 400 lb per sample	6
Moisture Content Samples	6
Splitspoon samples (3 at each location)	54
EMBANKMENT (FILL)	
Bulk Samples - 400 lb per sample	1
Moisture Content Samples	1
EXISTING SUBBASE	
Bulk Samples - 400 lb per sample	5
Moisture Content Samples	5
EXISTING CRUSHED ROCK BASE	
Bulk Samples - 400 lb per sample	3
Moisture Content Samples	3
DENSE GRADED AGGREGATE BASE	
Bulk Samples - compacted surface, 400 lb per sample	3
Moisture Content Samples	3
PERMEABLE ASPHALT TREATED BASE	
Bulk Samples - uncompacted, 100 lb per sample	3
ASPHALT TREATED BASE	
Bulk Sample - uncompacted, 200 lb per sample	3
Cores - 4 inch diameter	34
ASPHALT CONCRETE	
Bulk Samples - uncompacted, 200 lb per sample	3
Intermediate Course	
Surface Course	
Cores - 4 inch diameter	60
Asphalt Cement used for Asphalt Concrete - 5-gallon samples	3

Table 5B. Samples for Materials Reference Library - SPS-1.

Asphalt Cement - Three 5-gal pails of each type of asphalt cement used in the project.

Graded Coarse and Fine Aggregate - One 55-gal drum of the combined coarse and fine aggregate from each of the following: Asphalt Treated Base, Asphalt Concrete - Surface Course and Intermediate Course.

Uncompacted Asphalt Mix - Three 5-gallon pails of the uncompacted mix from each of the following: Asphalt Treated Base, Permeable Asphalt Treated Base, Asphalt Concrete - Surface Course and Intermediate Course.

Table 6. Summary of Field Tests on Each Layer - SPS-1.

Layer and Test/Measurement	Number of Locations	SHRP Protocol
SUBGRADE - 12 Sections		
Density and Moisture Tests (Nuclear Gauge)	6	Section 3.3.14, Reference 3
EMBANKMENT (FILL) - 1 Section		
Density and Moisture Tests (Nuclear Gauge)	4	Section 3.3.14, Reference 3
Elevation Measurements (65 per section)	65	Figure 6, Reference 5
EXISTING SUBBASE - 11 Sections		
Density and Moisture Tests (Nuclear Gauge)	14	Section 3.3.14, Reference 3
Elevation Measurements (65 per section)	260	Figure 6, Reference 5
EXISTING CRUSHED ROCK BASE - 7 Sections		
Density and Moisture Tests (Nuclear Gauge)	6	Section 3.3.14, Reference 3
Elevation Measurements (65 per section)	455	Figure 6, Reference 5
DENSE GRADED AGGREGATE BASE - 7 Sections		
Density and Moisture Tests (Nuclear Gauge)	24	Section 3.3.14, Reference 3
Elevation Measurements (65 per section)	455	Figure 6, Reference 5
PERMEABLE ASPHALT TREATED BASE- 6 Sections		
Elevation Measurements (65 per section)	390	Figure 6, Reference 5
ASPHALT TREATED BASE - 7 Sections		
Density Tests (Nuclear Gauge)	21	Section 3.3.14, Reference 3
Elevation Measurements (65 per section)	455	Figure 6, Reference 5
ASPHALT CONCRETE - 12 Sections		
Density Tests (Nuclear Gauge) Note: Perform tests on intermediate course and surface course (36 x 2)	72	Section 3.3.14, Reference 3
Elevation measurements (65 per section) Note: Perform measurements after completion of surface course only.	780	Figure 6, Reference 5

Table 7. Laboratory Materials Testing Plan for Each Layer - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
SUBGRADE					
Sieve Analysis	SS01	P51	6	-	X
Hydrometer to 0.001mm	SS02	P42	6	-	X
Atterberg Limits	SS03	P43	6	-	X
Classification (bulk samples)	SS04	P52	6	-	X
Classification (visual-manual on splitspoons)			18	X	-
Moisture - Density Relations	SS05	P55	6	-	X
Resilient Modulus (bulk samples)	SS07	P46	6	-	X
Natural Moisture Content	SS09	P49	6	-	X
Permeability (bulk samples)	UG09	P48	6	X	-
EMBANKMENT (FILL)					
Sieve Analysis	SS01	P51	1	-	X
Hydrometer to 0.001mm	SS02	P42	1	-	X
Atterberg Limits	SS03	P43	1	-	X
Classification (bulk sample)	SS04	P52	1	-	X
Moisture - Density Relations	SS05	P55	1	-	X
Resilient Modulus (bulk sample)	SS07	P46	1	-	X
Natural Moisture Content	SS09	P49	1	-	X
Permeability (bulk sample)	UG09	P48	1	X	-
EXISTING SUBBASE					
Particle Size Analysis	UG01	P41	5	-	X
Sieve Analysis (washed)	UG02	P41	5	-	X
Atterberg Limits	UG04	P43	5	-	X
Moisture - Density Relations	UG05	P44	5	-	X
Resilient Modulus	UG07	P46	5	-	X
Classification	UG08	P47	5	-	X
Permeability	UG09	P48	5	X	-
Natural Moisture Content	UG10	P49	5	-	X
EXISTING CRUSHED ROCK BASE					
Particle Size Analysis	UG01	P41	3	-	X
Sieve Analysis (washed)	UG02	P41	3	-	X
Atterberg Limits	UG04	P43	3	-	X
Moisture - Density Relations	UG05	P44	3	-	X
Resilient Modulus	UG07	P46	3	-	X
Classification	UG08	P47	3	-	X
Permeability	UG09	P48	3	X	-
Natural Moisture Content	UG10	P49	3	-	X

Table 7. Laboratory Materials Testing Plan for Each Layer - SPS-1 (continued).

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
DENSE GRADED AGGREGATE BASE					
Particle Size Analysis	UG01	P41	3	-	X
Sieve Analysis (washed)	UG02	P41	3	-	X
Atterberg Limits	UG04	P43	3	-	X
Moisture - Density Relations	UG05	P44	3	-	X
Resilient Modulus	UG07	P46	3	-	X
Classification	UG08	P47	3	-	X
Permeability	UG09	P48	3	X	-
Natural Moisture Content	UG10	P49	3	-	X
PERMEABLE ASPHALT TREATED BASE					
Asphalt Content (Extraction)	AC04	P04	3	X	-
Extracted Aggregate - Gradation	AG04	P14	3	X	-
ASPHALT TREATED BASE					
Core Examination/Thickness	AC01	P01	34	X	X
Bulk Specific Gravity	AC02	P02	34	X	X
Maximum Specific Gravity	AC03	P03	3	X	-
Asphalt Content (Extraction)	AC04	P04	3	X	-
Moisture Susceptibility	AC05	P05	3	X	-
Resilient Modulus	AC07	P07	9	-	X
Tensile Strength	AC07	P07	12	-	X
Asphalt Cement - Recovered					
Abson Recovery	AE01	P21	3	X	-
Penetration at 77F, 115F	AE02	P22	3	X	-
Specific Gravity (60F)	AE03	P23	3	X	-
Viscosity at 77F	AE04	P24	3	X	-
Viscosity at 140F, 275F	AE05	P25	3	X	-
Extracted Aggregate					
Specific Gravity - Coarse Aggregate	AG01	P11	3	X	-
Specific Gravity - Fine Aggregate	AG02	P12	3	X	-
Gradation of Aggregate	AG04	P14	3	X	-
NAA Test for Fine Aggregate	AG05	P14A	3	X	-

Table 7. Laboratory Materials Testing Plan for Each Layer - SPS-1 (continued).

Test	SHRP Test Designation	SHRP Protocol	No. of Tests	Test Conducted by:	
				State	FHWA
ASPHALT CONCRETE					
Core Examination/Thickness	AC01	P01	60	X	X
Bulk Specific Gravity	AC02	P02	120	X	X
Maximum Specific Gravity	AC03	P03	6	X	-
Asphalt Content (Extraction)	AC04	P04	6	X	-
Moisture Susceptibility	AC05	P05	6	X	-
Creep Modulus	AC06	P06	6	-	X
Resilient Modulus	AC07	P07	36	-	X
Tensile Strength	AC07	P07	48	-	X
NOTE: After core examination, the cores will be separated into surface and intermediate course. The tests for bulk specific gravity, creep modulus, resilient modulus and tensile strength includes cores from the surface course and the intermediate course.					
Asphalt Cement (Extracted)					
Abson Recovery	AE01	P21	6	X	-
Penetration at 77F and 115F	AE02	P22	6	X	-
Specific Gravity (60F)	AE03	P23	6	X	-
Viscosity at 77F	AE04	P24	6	X	-
Viscosity at 140F and 275F	AE05	P25	6	X	-
Extracted Aggregate					
Specific Gravity - Coarse Aggregate	AG01	P11	6	X	-
Specific Gravity - Fine Aggregate	AG02	P12	6	X	-
Gradation of Aggregate	AG04	P14	6	X	-
NAA Test for Fine Aggregate	AG05	P14A	6	X	-
Asphalt Cement (From Tanker)					
Penetration at 77F and 115F	AE02	P22	3	X	-
Specific Gravity (60F)	AE03	P23	3	X	-
Viscosity at 77F	AE04	P24	3	X	-
Viscosity at 140F and 275F	AE05	P25	3	X	-

**Table 8. Locations for Bulk Samples and Moisture Samples from
Prepared Subgrade - SPS-1.**

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B2	BS02, MS02	550113	913 + 50	6
B3	BS03, MS03	550118	930 + 50	6
B4	BS04, MS04	550120	950 + 50	6
B5	BS05, MS05	550119	964 + 50	6
B6	BS06, MS06	550123	981 + 50	6
B7	BS07, MS07	550117	998 + 50	6
NOTE: Perform nuclear moisture and density tests at these locations before obtaining bulk samples.				

Table 9. Locations for Splitspoon Sampling from Subgrade - SPS-1.

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
A1	JS01	550116	916 + 00	6
A1	JS02	550116	916 + 00	6
A1	JS03	550116	916 + 00	6
A2	JS04	550116	917 + 50	6
A2	JS05	550116	917 + 50	6
A2	JS06	550116	917 + 50	6
A3	JS07	550116	919 + 00	6
A3	JS08	550116	919 + 00	6
A3	JS09	550116	919 + 00	6
A4	JS10	550122	933 + 00	6
A4	JS11	550122	933 + 00	6
A4	JS12	550122	933 + 00	6
A5	JS13	550122	934 + 50	6
A5	JS14	550122	934 + 50	6
A5	JS15	550122	934 + 50	6
A6	JS16	550122	936 + 00	6
A6	JS17	550122	936 + 00	6
A6	JS18	550122	936 + 00	6
A7	JS19	550121	953 + 00	6
A7	JS20	550121	953 + 00	6
A7	JS21	550121	953 + 00	6
A8	JS22	550121	954 + 50	6
A8	JS23	550121	954 + 50	6
A8	JS24	550121	954 + 50	6
A9	JS25	550121	956 + 00	6
A9	JS26	550121	956 + 00	6
A9	JS27	550121	956 + 00	6
A10	JS28	550124	970 + 00	6
A10	JS29	550124	970 + 00	6
A10	JS30	550124	970 + 00	6
A11	JS31	550124	971 + 50	6
A11	JS32	550124	971 + 50	6
A11	JS33	550124	971 + 50	6
A12	JS34	550124	973 + 00	6
A12	JS35	550124	973 + 00	6
A12	JS36	550124	973 + 00	6
A13	JS37	550115	986 + 00	6
A13	JS38	550115	986 + 00	6
A13	JS39	550115	986 + 00	6

Table 9. Locations for Splitspoon Sampling from Subgrade - SPS-1 (continued).

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
A14	JS40	550115	987 + 50	6
A14	JS41	550115	987 + 50	6
A14	JS42	550115	987 + 50	6
A15	JS43	550115	989 + 00	6
A15	JS44	550115	989 + 00	6
A15	JS45	550115	989 + 00	6
A16	JS46	550114	1000 + 50	6
A16	JS47	550114	1000 + 50	6
A16	JS48	550114	1000 + 50	6
A17	JS49	550114	1002 + 00	6
A17	JS50	550114	1002 + 00	6
A17	JS51	550114	1002 + 00	6
A18	JS52	550114	1003 + 50	6
A18	JS53	550114	1003 + 50	6
A18	JS54	550114	1003 + 50	6

Table 10. Field and Laboratory Test Plan for Subgrade - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	6	T5 - T10	X	-
LABORATORY TESTS						
Sieve Analysis	SS01	P51	6	B2 - B7	-	X
Hydrometer to 0.001mm	SS02	P42	6	B2 - B7	-	X
Atterberg Limits	SS03	P43	6	B2 - B7	-	X
Classification (bulk samples)	SS04	P52	6	B2 - B7	-	X
Classification (spit spoons, NOTE 1)			18	A1 - A18	X	-
Moisture-Density Relations	SS05	P55	6	B2 - B7	-	X
Resilient Modulus	SS07	P46	6	B2 - B7	-	X
Natural Moisture Content	SS09	P49	6	B2 - B7	-	X
Permeability	UG09	P48	6	B2 - B7	X	-
NOTE 1: Visual-manual classification only						

**Table 11. Locations for In-place Density and
Moisture Tests on Prepared Subgrade - SPS-1.**

Sample Location Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
T5	550113	913 + 50	6
T6	550118	930 + 50	6
T7	550120	950 + 50	6
T8	550119	964 + 50	6
T9	550123	981 + 50	6
T10	550117	998 + 50	6

Table 12. Locations for Bulk Samples and Moisture Samples from Embankment (Fill) - SPS-1.

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B1	BS01, MS01	550113	907 + 50	6
NOTE: Perform nuclear moisture and density tests at this location before obtaining bulk samples.				

Table 13. Field and Laboratory Test Plan for Embankment (Fill) - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	4	T1 - T4	X	-
Elevation Measurements	-	-	65 per Section	Section 550113. See Table 15 of this report.	X	-
LABORATORY TESTS						
Sieve Analysis	SS01	P51	1	B1	-	X
Hydrometer to 0.001mm	SS02	P42	1	B1	-	X
Atterberg Limits	SS03	P43	1	B1	-	X
Classification (bulk sample)	SS04	P52	1	B1	-	X
Moisture-Density Relations	SS05	P55	1	B1	-	X
Resilient Modulus	SS07	P46	1	B1	-	X
Natural Moisture Content	SS09	P49	1	B1	-	X
Permeability	UG09	P48	1	B1	X	-

**Table 14. Locations for In-place Density and
Moisture Tests on Prepared Embankment - SPS-1.**

Sample Location Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
T1*	550113	907 + 50	6
T2	550113	909 + 00	4
T3	550113	910 + 50	4
T4	550113	912 + 00	4
NOTE: * - Bulk and moisture sampling locations. Perform nuclear moisture and density tests before obtaining samples.			

Table 15. Locations for Elevations Measurements - SPS-1.

Section Number	Station	Distance from Center Line of Pavement (feet)				
550113	907 + 75	0	3	6	9	12
	908 + 00	0	3	6	9	12
	908 + 50	0	3	6	9	12
	909 + 00	0	3	6	9	12
	909 + 50	0	3	6	9	12
	910 + 00	0	3	6	9	12
	910 + 50	0	3	6	9	12
	911 + 00	0	3	6	9	12
	911 + 50	0	3	6	9	12
	912 + 00	0	3	6	9	12
	912 + 50	0	3	6	9	12
	913 + 00	0	3	6	9	12
	913 + 25	0	3	6	9	12
550116	914 + 75	0	3	6	9	12
	915 + 00	0	3	6	9	12
	915 + 50	0	3	6	9	12
	916 + 00	0	3	6	9	12
	916 + 50	0	3	6	9	12
	917 + 00	0	3	6	9	12
	917 + 50	0	3	6	9	12
	918 + 00	0	3	6	9	12
	918 + 50	0	3	6	9	12
	919 + 00	0	3	6	9	12
	919 + 50	0	3	6	9	12
	920 + 00	0	3	6	9	12
	920 + 25	0	3	6	9	12
550118	924 + 75	0	3	6	9	12
	925 + 00	0	3	6	9	12
	925 + 50	0	3	6	9	12
	926 + 00	0	3	6	9	12
	926 + 50	0	3	6	9	12
	927 + 00	0	3	6	9	12
	927 + 50	0	3	6	9	12
	928 + 00	0	3	6	9	12
	928 + 50	0	3	6	9	12
	929 + 00	0	3	6	9	12
	929 + 50	0	3	6	9	12
	930 + 00	0	3	6	9	12
	930 + 25	0	3	6	9	12
550122	931 + 75	0	3	6	9	12
	932 + 00	0	3	6	9	12
	932 + 50	0	3	6	9	12
	933 + 00	0	3	6	9	12
	933 + 50	0	3	6	9	12
	934 + 00	0	3	6	9	12
	934 + 50	0	3	6	9	12
	935 + 00	0	3	6	9	12
	935 + 50	0	3	6	9	12
	936 + 00	0	3	6	9	12
	936 + 50	0	3	6	9	12
	937 + 00	0	3	6	9	12
	937 + 25	0	3	6	9	12

Table 15. Locations for Elevations Measurements - SPS-1 (continued).

Section Number	Station	Distance from Center Line of Pavement (feet)				
550120	944 + 75	0	3	6	9	12
	945 + 00	0	3	6	9	12
	945 + 50	0	3	6	9	12
	946 + 00	0	3	6	9	12
	946 + 50	0	3	6	9	12
	947 + 00	0	3	6	9	12
	947 + 50	0	3	6	9	12
	948 + 00	0	3	6	9	12
	948 + 50	0	3	6	9	12
	949 + 00	0	3	6	9	12
	949 + 50	0	3	6	9	12
	950 + 00	0	3	6	9	12
	950 + 25	0	3	6	9	12
550121	951 + 75	0	3	6	9	12
	952 + 00	0	3	6	9	12
	952 + 50	0	3	6	9	12
	953 + 00	0	3	6	9	12
	953 + 50	0	3	6	9	12
	954 + 00	0	3	6	9	12
	954 + 50	0	3	6	9	12
	955 + 00	0	3	6	9	12
	955 + 50	0	3	6	9	12
	956 + 00	0	3	6	9	12
	956 + 50	0	3	6	9	12
	957 + 00	0	3	6	9	12
	957 + 25	0	3	6	9	12
550119	958 + 75	0	3	6	9	12
	959 + 00	0	3	6	9	12
	959 + 50	0	3	6	9	12
	960 + 00	0	3	6	9	12
	960 + 50	0	3	6	9	12
	961 + 00	0	3	6	9	12
	961 + 50	0	3	6	9	12
	962 + 00	0	3	6	9	12
	962 + 50	0	3	6	9	12
	963 + 00	0	3	6	9	12
	963 + 50	0	3	6	9	12
	964 + 00	0	3	6	9	12
	964 + 25	0	3	6	9	12
550124	968 + 75	0	3	6	9	12
	969 + 00	0	3	6	9	12
	969 + 50	0	3	6	9	12
	970 + 00	0	3	6	9	12
	970 + 50	0	3	6	9	12
	971 + 00	0	3	6	9	12
	971 + 50	0	3	6	9	12
	972 + 00	0	3	6	9	12
	972 + 50	0	3	6	9	12
	973 + 00	0	3	6	9	12
	973 + 50	0	3	6	9	12
	974 + 00	0	3	6	9	12
	974 + 25	0	3	6	9	12

Table 15. Locations for Elevations Measurements - SPS-1 (continued).

Section Number	Station	Distance from Center Line of Pavement (feet)				
550123	975 + 75	0	3	6	9	12
	976 + 00	0	3	6	9	12
	976 + 50	0	3	6	9	12
	977 + 00	0	3	6	9	12
	977 + 50	0	3	6	9	12
	978 + 00	0	3	6	9	12
	978 + 50	0	3	6	9	12
	979 + 00	0	3	6	9	12
	979 + 50	0	3	6	9	12
	980 + 00	0	3	6	9	12
	980 + 50	0	3	6	9	12
	981 + 00	0	3	6	9	12
	981 + 25	0	3	6	9	12
550115	984 + 75	0	3	6	9	12
	985 + 00	0	3	6	9	12
	985 + 50	0	3	6	9	12
	986 + 00	0	3	6	9	12
	986 + 50	0	3	6	9	12
	987 + 00	0	3	6	9	12
	987 + 50	0	3	6	9	12
	988 + 00	0	3	6	9	12
	988 + 50	0	3	6	9	12
	989 + 00	0	3	6	9	12
	989 + 50	0	3	6	9	12
	990 + 00	0	3	6	9	12
	990 + 25	0	3	6	9	12
550117	992 + 75	0	3	6	9	12
	993 + 00	0	3	6	9	12
	993 + 50	0	3	6	9	12
	994 + 00	0	3	6	9	12
	994 + 50	0	3	6	9	12
	995 + 00	0	3	6	9	12
	995 + 50	0	3	6	9	12
	996 + 00	0	3	6	9	12
	996 + 50	0	3	6	9	12
	997 + 00	0	3	6	9	12
	997 + 50	0	3	6	9	12
	998 + 00	0	3	6	9	12
	998 + 25	0	3	6	9	12
550114	999 + 25	0	3	6	9	12
	999 + 50	0	3	6	9	12
	1000 + 00	0	3	6	9	12
	1000 + 50	0	3	6	9	12
	1001 + 00	0	3	6	9	12
	1001 + 50	0	3	6	9	12
	1002 + 00	0	3	6	9	12
	1002 + 50	0	3	6	9	12
	1003 + 00	0	3	6	9	12
	1003 + 50	0	3	6	9	12
	1004 + 00	0	3	6	9	12
	1004 + 50	0	3	6	9	12
	1004 + 75	0	3	6	9	12

Table 16. Locations for FWD Tests - SPS-1.

Section Number	Locations for FWD Tests	
	Distance from Center Line of Pavement	
	9.5 +/- 0.5 ft. (Outer Wheel Path)	6.0 +/- 0.5 ft. (Mid lane)
550113	907 + 75	907 + 75
	908 + 00	908 + 25
	908 + 50	908 + 75
	909 + 00	909 + 25
	909 + 50	909 + 75
	910 + 00	910 + 25
	910 + 50	910 + 75
	911 + 00	911 + 25
	911 + 50	911 + 75
	912 + 00	912 + 25
	912 + 50	912 + 75
	913 + 00	913 + 25
	913 + 25	-
550116	914 + 75	914 + 75
	915 + 00	915 + 25
	915 + 50	915 + 75
	916 + 00	916 + 25
	916 + 50	916 + 75
	917 + 00	917 + 25
	917 + 50	917 + 75
	918 + 00	918 + 25
	918 + 50	918 + 75
	919 + 00	919 + 25
	919 + 50	919 + 75
	920 + 00	920 + 25
	920 + 25	-
550118	924 + 75	924 + 75
	925 + 00	925 + 25
	925 + 50	925 + 75
	926 + 00	926 + 25
	926 + 50	926 + 75
	927 + 00	927 + 25
	927 + 50	927 + 75
	928 + 00	928 + 25
	928 + 50	928 + 75
	929 + 00	929 + 25
	929 + 50	929 + 75
	930 + 00	930 + 25
	930 + 25	-
550122	931 + 75	931 + 75
	932 + 00	932 + 25
	932 + 50	932 + 75
	933 + 00	933 + 25
	933 + 50	933 + 75
	934 + 00	934 + 25
	934 + 50	934 + 75
	935 + 00	935 + 25
	935 + 50	935 + 75
	936 + 00	936 + 25
	936 + 50	936 + 75
	937 + 00	937 + 25
	937 + 25	-

Table 16. Locations for FWD Tests - SPS-1 (continued).

Section Number	Locations for FWD Tests	
	Distance from Center Line of Pavement	
	9.5 +/- 0.5 ft. (Outer Wheel Path)	6.0 +/- 0.5 ft. (Mid lane)
550120	944 + 75	944 + 75
	945 + 00	945 + 25
	945 + 50	945 + 75
	946 + 00	946 + 25
	946 + 50	946 + 75
	947 + 00	947 + 25
	947 + 50	947 + 75
	948 + 00	948 + 25
	948 + 50	948 + 75
	949 + 00	949 + 25
	949 + 50	949 + 75
	950 + 00	950 + 25
	950 + 25	-
550121	951 + 75	951 + 75
	952 + 00	952 + 25
	952 + 50	952 + 75
	953 + 00	953 + 25
	953 + 50	953 + 75
	954 + 00	954 + 25
	954 + 50	954 + 75
	955 + 00	955 + 25
	955 + 50	955 + 75
	956 + 00	956 + 25
	956 + 50	956 + 75
	957 + 00	957 + 25
	957 + 25	-
550119	958 + 75	958 + 75
	959 + 00	959 + 25
	959 + 50	959 + 75
	960 + 00	960 + 25
	960 + 50	960 + 75
	961 + 00	961 + 25
	961 + 50	961 + 75
	962 + 00	962 + 25
	962 + 50	962 + 75
	963 + 00	963 + 25
	963 + 50	963 + 75
	964 + 00	964 + 25
	964 + 25	-
550124	968 + 75	968 + 75
	969 + 00	968 + 25
	969 + 50	969 + 75
	970 + 00	969 + 25
	970 + 50	970 + 75
	971 + 00	970 + 25
	971 + 50	971 + 75
	972 + 00	972 + 25
	972 + 50	972 + 75
	973 + 00	973 + 25
	973 + 50	973 + 75
	974 + 00	974 + 25
	974 + 25	-

Table 16. Locations for FWD Tests - SPS-1 (continued).

Section Number	Locations for FWD Tests	
	Distance from Center Line of Pavement	
	9.5 +/- 0.5 ft. (Outer Wheel Path)	6.0 +/- 0.5 ft. (Mid lane)
550123	975 + 75	975 + 75
	976 + 00	976 + 25
	976 + 50	976 + 75
	977 + 00	977 + 25
	977 + 50	977 + 75
	978 + 00	978 + 25
	978 + 50	978 + 75
	979 + 00	979 + 25
	979 + 50	979 + 75
	980 + 00	980 + 25
	980 + 50	980 + 75
	981 + 00	981 + 25
	981 + 25	-
550115	984 + 75	984 + 75
	985 + 00	985 + 25
	985 + 50	985 + 75
	986 + 00	986 + 25
	986 + 50	986 + 75
	987 + 00	987 + 25
	987 + 50	987 + 75
	988 + 00	988 + 25
	988 + 50	988 + 75
	989 + 00	989 + 25
	989 + 50	989 + 75
	990 + 00	990 + 25
	990 + 25	-
550117	992 + 75	992 + 75
	993 + 00	993 + 25
	993 + 50	993 + 75
	994 + 00	994 + 25
	994 + 50	994 + 75
	995 + 00	995 + 25
	995 + 50	995 + 75
	996 + 00	996 + 25
	996 + 50	996 + 75
	997 + 00	997 + 25
	997 + 50	997 + 75
	998 + 00	998 + 25
	998 + 25	-
550114	999 + 25	999 + 25
	999 + 50	999 + 75
	1000 + 00	1000 + 25
	1000 + 50	1000 + 75
	1001 + 00	1001 + 25
	1001 + 50	1001 + 75
	1002 + 00	1002 + 25
	1002 + 50	1002 + 75
	1003 + 00	1003 + 25
	1003 + 50	1003 + 75
	1004 + 00	1004 + 25
	1004 + 50	1004 + 75
	1004 + 75	-

**Table 17. Locations for Bulk Samples and Moisture Samples from
Existing Subbase - SPS-1.**

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B8	BG01, MG01	550116	920 + 50	6
B9	BG02, MG02	550122	937 + 50	6
B10	BG03, MG03	550119	964 + 50	6
B11	BG04, MG04	550115	990 + 50	6
B12	BG05, MG05	550117	998 + 50	6
NOTE: Perform nuclear moisture and density tests at these locations before obtaining bulk samples.				

Table 18. Field and Laboratory Test Plan for Existing Subbase - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	14	T11 - T24	X	-
Elevation Measurements	-	-	65 per Section	Table 15 of this report	X	-
LABORATORY TESTS						
Particle Size Analysis	UG01	P41	5	B8 - B12	-	X
Sieve Analysis (washed)	UG02	P41	5	B8 - B12	-	X
Atterberg Limits	UG04	P43	5	B8 - B12	-	X
Moisture-Density Relations	UG05	P44	5	B8 - B12	-	X
Resilient Modulus	UG07	P46	5	B8 - B12	-	X
Classification	UG08	P47	5	B8 - B12	-	X
Permeability	UG09	P48	5	B8 - B12	X	-
Natural Moisture Content	UG10	P49	5	B8 - B12	-	X

**Table 19. Locations for In-place Density and Moisture Tests on
Existing Subbase - SPS-1.**

Test Location Designation	Reference Monitoring Section	Test Location	Offset from Center Line of Pavement (ft)
T11*	550116	920 + 50	6
T12*	550122	937 + 50	6
T13	550121	953 + 00	6
T14	550121	954 + 50	6
T15	550121	956 + 00	6
T16*	550119	964 + 50	6
T17	550123	977 + 00	6
T18	550123	978 + 50	6
T19	550123	980 + 00	6
T20*	550115	990 + 50	6
T21*	550117	998 + 50	6
T22	550114	1000 + 50	6
T23	550114	1002 + 00	6
T24	550114	1003 + 50	6
NOTE: * - Bulk and moisture sampling locations. Perform nuclear moisture and density tests before obtaining samples.			

**Table 20. Locations for Bulk Samples and Moisture Samples from
Existing Crushed Rock Base - SPS-1.**

Sample Location Designation	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B13	BG06, MG06	550122	937 + 50	6
B14	BG07, MG07	550119	964 + 50	6
B15	BG08, MG08	550117	998 + 50	6
NOTE: Perform nuclear moisture and density tests at these locations before obtaining bulk samples.				

Table 21. Field and Laboratory Test Plan for Existing Crushed Rock Base - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	6	T25 - T30	X	-
Elevation Measurements	-	-	65 per Section	Table 15 of this report	X	-
LABORATORY TESTS						
Particle Size Analysis	UG01	P41	3	B13 - B15	-	X
Sieve Analysis (washed)	UG02	P41	3	B13 - B15	-	X
Atterberg Limits	UG04	P43	3	B13 - B15	-	X
Moisture-Density Relations	UG05	P44	3	B13 - B15	-	X
Resilient Modulus	UG07	P46	3	B13 - B15	-	X
Classification	UG08	P47	3	B13 - B15	-	X
Permeability	UG09	P48	3	B13 - B15	X	-
Natural Moisture Content	UG10	P49	3	B13 - B15	-	X

**Table 22. Locations for In-place Density and Moisture Tests on
Existing Crushed Rock Base - SPS-1.**

Test Location Designation	Reference Monitoring Section	Test Location	Offset from Center Line of Pavement (ft)
T25	550122	933 + 00	6
T26	550122	934 + 50	6
T27	550122	936 + 00	6
T28*	550122	937 + 50	6
T29*	550119	964 + 50	6
T30*	550117	998 + 50	6
NOTE: * - Bulk and moisture sampling locations. Perform nuclear moisture and density tests before obtaining samples.			

**Table 23. Locations for Bulk Samples and Moisture Samples from
Prepared Aggregate Base - SPS-1.**

Testing Location	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B16	BG09, MG09	550113	907 + 50	6
B17	BG10, MG10	550120	944 + 50	6
B18	BG11, MG11	550114	999 + 00	6
NOTE: Perform nuclear moisture and density tests at these locations before obtaining bulk samples.				

Table 24. Field and Laboratory Test Plan for Aggregate Base - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
In-Place Density & Moisture	-	Section 3.3.14 Reference 3	24	T31 - T54	X	-
Elevation Measurements	-	-	65 per Section	Table 15 of this report	X	-
LABORATORY TESTS						
Particle Size Analysis	UG01	P41	3	B16 - B18	-	X
Sieve Analysis (washed)	UG02	P41	3	B16 - B18	-	X
Atterberg Limits	UG04	P43	3	B16 - B18	-	X
Moisture-Density Relations	UG05	P44	3	B16 - B18	-	X
Resilient Modulus	UG07	P46	3	B16 - B18	-	X
Classification	UG08	P47	3	B16 - B18	-	X
Permeability	UG09	P48	3	B16 - B18	X	-
Natural Moisture Content	UG10	P49	3	B16 - B18	-	X

**Table 25. Locations for In-place Density and Moisture Tests on
Compacted Aggregate Base - SPS-1.**

Test Location Designation	Reference Monitoring Section	Test Location	Offset from Center Line of Pavement (ft)
T31*	550113	907 + 50	6
T32	550113	909 + 00	6
T33	550113	910 + 50	6
T34	550113	912 + 00	6
T35	550118	926 + 00	6
T36	550118	927 + 50	6
T37	550118	929 + 00	6
T38*	550120	944 + 50	6
T39	550120	946 + 00	6
T40	550120	947 + 50	6
T41	550120	949 + 00	6
T42	550121	953 + 00	6
T43	550121	954 + 50	6
T44	550121	956 + 00	6
T45	550119	960 + 00	6
T46	550119	961 + 50	6
T47	550119	963 + 00	6
T48	550117	994 + 00	6
T49	550117	995 + 50	6
T50	550117	997 + 00	6
T51*	550114	999 + 00	6
T52	550114	1000 + 50	6
T53	550114	1002 + 00	6
T54	550114	1003 + 50	6
NOTE: * - Bulk and moisture sampling locations. Perform nuclear moisture and density tests before obtaining samples.			

**Table 26. Locations for Bulk Samples of Permeable
Asphalt Treated Base - SPS-1.**

Testing Location (NOTE)	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B19	BT01	550122	934 + 50	6
B20	BT02	550119	961 + 50	6
B21	BT03	550123	978 + 50	6
NOTE: Sample from the paver or the haul vehicle for the mix to be placed at the specified location.				

Table 27. Field and Laboratory Test Plan for Permeable Asphalt Treated Base (PATB) - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
Elevation Measurements	-	-	65 per Section	Table 15 of this report	X	-
LABORATORY TESTS						
Asphalt Content (Extraction)	AC04	P04	3	B19 - B21	X	-
Extracted Aggregate						
Gradation of Aggregate	AG04	P14	3	B19 - B21	X	-

Table 28. Locations for Bulk Sampling of Asphalt Treated Base (ATB) - SPS-1.

Testing Location (NOTE)	Sample Designation	Reference Monitoring Section	Sampling Location	Offset from Center Line of Pavement (ft)
B22	BT20	550118	927 + 50	6
B23	BT21	550123	978 + 50	6
B24	BT22	550117	995 + 50	6
NOTE: Take samples of uncompacted asphalt treated base from the haul vehicle or paver for the mix to be placed at the given locations.				

Table 29. Locations for Cores from Asphalt Treated Base - SPS-1.

Reference Monitoring Section	Core Location	Core Number	Offset from Center Line of Pavement (ft)
550116	914 + 75	C7	9.0
		C8	6.0
	920 + 25	C9	9.0
		C10	6.0
550118	924 + 75	C11	9.0
		C12	7.5
		C13	6.0
		C14	4.5
	930 + 25	C15	9.0
		C16	6.0
550122	931 + 75	C17	9.0
		C18	6.0
	937 + 25	C19	9.0
		C20	6.0
550124	968 + 75	C37	9.0
		C38	7.5
		C39	6.0
		C40	4.5
	974 + 25	C41	9.0
		C42	6.0
550123	975 + 75	C43	9.0
		C44	6.0
	981 + 25	C45	9.0
		C46	6.0
550115	984 + 75	C47	9.0
		C48	6.0
	990 + 25	C49	9.0
		C50	6.0
550117	992 + 75	C51	9.0
		C52	7.5
		C53	6.0
		C54	4.5
	998 + 25	C55	9.0
		C56	6.0
NOTE: Obtain ATB cores when obtaining cores from asphalt concrete surface.			

Table 30. Field and Laboratory Test Plan for Asphalt Treated Base (ATB) - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
Nuclear Density Tests	-	Section 3.3.14 Reference 3	21	T55 - T75	X	-
Elevation Measurements	-	-	65 per Section	See Table 15 of this report.	X	-
LABORATORY TESTS						
Core Examination/Thickness	AC01	P01	34	C7-C20, C37-C56	X	X
Bulk Specific Gravity	AC02	P02	34	C7-C20, C37-C56	X	X
Maximum Specific Gravity	AC03	P03	3	B22 - B24	X	-
Asphalt Content (Extraction)	AC04	P04	3	B22 - B24	X	-
Moisture Susceptibility	AC05	P05	3	B22 - B24	X	-
Resilient Modulus	AC07	P07	9	C11-C13, C37-C39, C51-C53	-	X
Tensile Strength	AC07	P07	12	C11-C14, C37-C40, C51-C54	-	X
Extracted Aggregate						
Specific Gravity - Coarse Agg.	AG01	P11	3	B22 - B24	X	-
Specific Gravity - Fine Agg.	AG02	P12	3	B22 - B24	X	-
Gradation of Aggregate	AG04	P14	3	B22 - B24	X	-
NAA Test for Fine Aggregate	AG05	P14A	3	B22 - B24	X	-
Asphalt Cement (Extracted)						
Abson Recovery	AE01	P21	3	B22 - B24	X	-
Penetration at 77F and 115F	AE02	P22	3	B22 - B24	X	-
Specific Gravity (60F)	AE03	P23	3	B22 - B24	X	-
Viscosity at 77F	AE04	P24	3	B22 - B24	X	-
Viscosity at 140F and 275F	AG05	P25	3	B22 - B24	X	-

Table 31. Locations for In-place Density Tests on
Prepared Asphalt Treated Base - SPS-1.

Test Location Designation	Reference Monitoring Section	Test Location	Offset from Center Line of Pavement (ft)
T55	550116	916 + 00	6
T56	550116	917 + 50	6
T57	550116	919 + 00	6
T58	550118	926 + 00	6
T59	550118	927 + 50	6
T60	550118	929 + 00	6
T61	550122	933 + 00	6
T62	550122	934 + 50	6
T63	550122	936 + 00	6
T64	550124	970 + 00	6
T65	550124	971 + 50	6
T66	550124	973 + 00	6
T67	550123	977 + 00	6
T68	550123	978 + 50	6
T69	550123	980 + 00	6
T70	550115	986 + 00	6
T71	550115	987 + 50	6
T72	550115	989 + 00	6
T73	550117	994 + 00	6
T74	550117	995 + 50	6
T75	550117	997 + 00	6

**Table 32. Locations for Bulk Sampling of Asphalt Concrete
and Asphalt Cement - SPS-1.**

Asphalt Concrete Sampling Location (NOTE 1)	Sampling Location Station	Reference Monitoring Section	Bulk Asphalt Concrete Sample Designation (NOTE 1)	Asphalt Cement Sample Designation (NOTE 2)
B25	917 + 50	550116	BA01, BA20	BC01
B26	954 + 50	550121	BA02, BA21	BC02
B27	987 + 50	550115	BA03, BA22	BC03
<p>NOTE 1: Take samples of uncompacted asphalt concrete from the haul vehicle or paver for the mix to be placed at the given locations. Samples shall be obtained from the intermediate course and the surface course at the specified locations. Samples from the intermediate course shall have sample numbers BA01, BA02, and BA03, while samples from the surface course shall have sample numbers BA20, BA21, and BA22.</p> <p>NOTE 2: Obtain from the plant a 5-gallon sample of asphalt cement used in the asphalt concrete mix that is placed at the specified location.</p>				

Table 33. Locations for Asphalt Concrete Cores - SPS-1.

Reference Monitoring Section	Core Location	Core Number	Offset from Center Line of Pavement (ft)	Core From ATB?
550113	907 + 75	C1	9.0	No
		C2	7.5	No
		C3	6.0	No
		C4	4.5	No
	913 + 25	C5	9.0	No
		C6	6.0	No
550116	914 + 75	C7	9.0	Yes
		C8	6.0	Yes
	920 + 25	C9	9.0	Yes
		C10	6.0	Yes
550118	924 + 75	C11	9.0	Yes
		C12	7.5	Yes
		C13	6.0	Yes
		C14	4.5	Yes
	930 + 25	C15	9.0	Yes
		C16	6.0	Yes
550122	931 + 75	C17	9.0	Yes
		C18	6.0	Yes
	937 + 25	C19	9.0	Yes
		C20	6.0	Yes
550120	944 + 75	C21	9.0	No
		C22	7.5	No
		C23	6.0	No
		C24	4.5	No
	950 + 25	C25	9.0	No
		C26	6.0	No
550121	951 + 75	C27	9.0	No
		C28	6.0	No
	957 + 25	C29	9.0	No
		C30	6.0	No
550119	958 + 75	C31	9.0	No
		C32	7.5	No
		C33	6.0	No
		C34	4.5	No
	964 + 25	C35	9.0	No
		C36	6.0	No

Table 33. Locations for Asphalt Concrete Cores - SPS-1 (continued).

Reference Monitoring Section	Core Location	Core Number	Offset from Center Line of Pavement (ft)	Core From ATB?
550124	968 + 75	C37	9.0	Yes
		C38	7.5	Yes
		C39	6.0	Yes
		C40	4.5	Yes
	974 + 25	C41	9.0	Yes
		C42	6.0	Yes
550123	975 + 75	C43	9.0	Yes
		C44	6.0	Yes
	981 + 25	C45	9.0	Yes
		C46	6.0	Yes
550115	984 + 75	C47	9.0	Yes
		C48	6.0	Yes
	990 + 25	C49	9.0	Yes
		C50	6.0	Yes
550117	992 + 75	C51	9.0	Yes
		C52	7.5	Yes
		C53	6.0	Yes
		C54	4.5	Yes
	998 + 25	C55	9.0	Yes
		C56	6.0	Yes
550114	999 + 25	C57	9.0	No
		C58	6.0	No
	1004 + 75	C59	9.0	No
		C60	6.0	No

Table 34. Field and Laboratory Test Plan for Asphalt Concrete - SPS-1.

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by:	
					State	FHWA
FIELD TESTS						
Nuclear Density Tests	-	Section 3.3.14 Reference 3	36 per course	T76 - T111	X	-
Elevation Measurements	-	-	65 per Section	See table 15 of this report.	X	-
LABORATORY TESTS						
Asphalt Concrete Surface and Binder						
Core Examination/Thickness	AC01	P01	60	C1 - C60	X	X
Bulk Specific Gravity	AC02	P02	120	C1 - C60 (When the cores are sawed to separate intermediate and surface course there will be 120 samples)	X	X
Maximum Specific Gravity	AC03	P03	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Asphalt Content (Extraction)	AC04	P04	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Moisture Susceptibility	AC05	P05	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Creep Modulus (NOTE 1)	AC06	P06	6	C9I, C9S, C19I, C19S, C47I, C47S	-	X
Resilient Modulus (NOTE 1)	AC07	P07	36	C1I, C1S, C2I, C2S, C3I, C3S, C11I, C11S, C12I, C12S, C13I, C13S, C21I, C21S, C22I, C22S, C23I, C23S, C31I, C31S, C32I, C32S, C33I, C33S, C37I, C37S, C38I, C38S, C39I, C39S, C51I, C51S, C52I, C52S, C53I, C53S	-	X
Tensile Strength (NOTE 1)	AC07	P07	48	C1I, C1S, C2I, C2S, C3I, C3S, C4I, C4S, C11I, C11S, C12I, C12S, C13I, C13S, C14I, C14S, C21I, C21S, C22I, C22S, C23I, C23S, C24I, C24S, C31I, C31S, C32I, C32S, C33I, C33S, C34I, C34S, C37I, C37S, C38I, C38S, C39I, C39S, C40I, C40S, C51I, C51S, C52I, C52S, C53I, C53S C54I, C54S	-	X

Table 34. Field and Laboratory Test Plan for Asphalt Concrete - SPS-1 (continued).

Test	SHRP Test Designation	SHRP Protocol	Number of Tests	Material Source/ Test Location	Test Conducted by	
					State	FHWA
Extracted Aggregate						
Specific Gravity - Coarse Agg.	AG01	P11	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Specific Gravity - Fine Agg	AG02	P12	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Gradation of Aggregate	AG04	P14	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
NAA Test for Fine Aggregate	AG05	P14A	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Asphalt Cement (Recovered and Extracted)						
Abson Recovery	AE01	P21	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Penetration at 77F, 115F	AE02	P22	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Specific Gravity (60F)	AE03	P23	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Viscosity at 77F	AE04	P24	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Viscosity at 140F, 275F	AE05	P25	6	BA01, BA02, BA03, BA20, BA21, BA22 -- NOTE 2	X	-
Asphalt Cement (From Plant)						
Penetration at 77F, 115F	AE02	P22	3	BC01 - BC03	X	-
Specific Gravity (60F)	AE03	P23	3	BC01 - BC03	X	-
Viscosity at 77F	AE04	P24	3	BC01 - BC03	X	-
Viscosity at 140F, 275F	AE05	P25	3	BC01 - BC03	X	-
<p>NOTE 1: Each asphalt concrete core contains two different layers (intermediate course and surface course). The last digit of core designation refers to these layers. "I" is for intermediate course and "S" is for surface course.</p> <p>NOTE 2: Samples BA01, BA02, and BA03 are from intermediate course, while samples BA20, BA21, and BA22 are from the surface course.</p>						

**Table 35. Locations for In-place Density Tests on Prepared
Asphalt Concrete (Intermediate and Surface Layers) - SPS-1.**

Test Location Designation	Reference Monitoring Section	Test Location	Offset from Center Line of Pavement (ft)
T76	550113	909 + 00	6
T77	550113	910 + 50	6
T78	550113	912 + 00	6
T79	550116	916 + 00	6
T80	550116	917 + 50	6
T81	550116	919 + 00	6
T82	550118	926 + 00	6
T83	550118	927 + 50	6
T84	550118	929 + 00	6
T85	550122	933 + 00	6
T86	550122	934 + 50	6
T87	550122	936 + 00	6
T88	550120	946 + 00	6
T89	550120	947 + 50	6
T90	550120	949 + 00	6
T91	550121	953 + 00	6
T92	550121	954 + 50	6
T93	550121	956 + 00	6
T94	550119	960 + 00	6
T95	550119	961 + 50	6
T96	550119	963 + 00	6
T97	550124	970 + 00	6
T98	550124	971 + 50	6
T99	550124	973 + 00	6
T100	550123	977 + 00	6
T101	550123	978 + 50	6
T102	550123	980 + 00	6
T103	550115	986 + 00	6
T104	550115	987 + 50	6
T105	550115	989 + 00	6
T106	550117	994 + 00	6
T107	550117	995 + 50	6
T108	550117	997 + 00	6
T109	550114	1000 + 50	6
T110	550114	1002 + 00	6
T111	550114	1003 + 50	6

Table 36. Samples to be Shipped to the
State Laboratory (or their designee) - SPS-1.

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Asphalt Concrete			
C5	CA05	1	4 in core
C6	CA06	1	4 in core
C7	CA07	2	4 in core
C8	CA08	2	4 in core
C10	CA10	1	4 in core
C15	CA15	1	4 in core
C16	CA16	1	4 in core
C17	CA17	2	4 in core
C18	CA18	2	4 in core
C20	CA20	1	4 in core
C25	CA25	1	4 in core
C26	CA26	1	4 in core
C27	CA27	2	4 in core
C28	CA28	2	4 in core
C29	CA29	1	4 in core
C30	CA30	1	4 in core
C35	CA35	1	4 in core
C36	CA36	1	4 in core
C41	CA41	1	4 in core
C42	CA42	1	4 in core
C43	CA43	2	4 in core
C44	CA44	2	4 in core
C45	CA45	1	4 in core
C46	CA46	1	4 in core
C48	CA48	2	4 in core
C49	CA49	1	4 in core
C50	CA50	1	4 in core
C55	CA55	1	4 in core
C56	CA56	1	4 in core
C57	CA57	2	4 in core
C58	CA58	2	4 in core
C59	CA59	1	4 in core
C60	CA60	1	4 in core
B25	BA01	3	200 lb bulk sample - intermediate
B26	BA02	3	200 lb bulk sample - intermediate
B27	BA03	3	200 lb bulk sample - intermediate
B25	BA20	3	200 lb bulk sample - surface
B26	BA21	3	200 lb bulk sample - surface
B27	BA22	3	200 lb bulk sample - surface
-	BC01	3	5 gal bulk sample of asphalt cement
-	BC02	3	5 gal bulk sample of asphalt cement
-	BC03	3	5 gal bulk sample of asphalt cement

Table 36. Samples to be Shipped to the
State Laboratory (or their designee) - SPS-1 (continued).

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Asphalt Treated Base			
C7	CT07	2	4 in core
C8	CT08	2	4 in core
C9	CT09	1	4 in core
C10	CT10	1	4 in core
C15	CT15	1	4 in core
C16	CT16	1	4 in core
C17	CT17	2	4 in core
C18	CT18	2	4 in core
C19	CT19	1	4 in core
C20	CT20	1	4 in core
C41	CT41	1	4 in core
C42	CT42	1	4 in core
C43	CT43	2	4 in core
C44	CT44	2	4 in core
C45	CT45	1	4 in core
C46	CT46	1	4 in core
C47	CT47	2	4 in core
C48	CT48	2	4 in core
C49	CT49	1	4 in core
C50	CT50	1	4 in core
C55	CT55	1	4 in core
C56	CT56	1	4 in core
B22	BT20	3	200 lb bulk sample
B23	BT21	3	200 lb bulk sample
B24	BT22	3	200 lb bulk sample
Permeable Asphalt Treated Base			
B19	BT01	3	100 lb bulk sample
B20	BT02	3	100 lb bulk sample
B21	BT03	3	100 lb bulk sample
Unbound Granular Base			
B16	BG09	2	*400 lb bulk sample
B17	BG10	2	*400 lb bulk sample
B18	BG11	2	*400 lb bulk sample
Existing Crushed Rock Base			
B13	BG06	1	*400 lb bulk sample
B14	BG07	1	*400 lb bulk sample
B15	BG08	1	*400 lb bulk sample

Table 36. Samples to be Shipped to the
State Laboratory (or their designee) - SPS-1 (continued).

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Existing Subbase			
B8	BG01	1	*400 lb bulk sample
B9	BG02	1	*400 lb bulk sample
B10	BG03	1	*400 lb bulk sample
B11	BG04	1	*400 lb bulk sample
B12	BG05	1	*400 lb bulk sample
Subgrade			
B2	BS02	1	*400 lb bulk sample
B3	BS03	1	*400 lb bulk sample
B4	BS04	1	*400 lb bulk sample
B5	BS05	1	*400 lb bulk sample
B6	BS06	1	*400 lb bulk sample
B7	BS07	1	*400 lb bulk sample
Embankment (Fill)			
B1	BS01	2	*400 lb bulk sample
NOTE: * The bulk sample is to be shipped to the participating agency laboratory where it is to be split and quartered. A 300 lb portion of the bulk sample is then to be shipped to the FHWA-LTPP Testing Contractor Laboratory for further testing.			

Table 37. Samples to be Shipped to the
FHWA-LTPP Contractor Laboratory - SPS-1.

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Asphalt Concrete			
C1	CA01	2	4 in core
C2	CA02	2	4 in core
C3	CA03	2	4 in core
C4	CA04	2	4 in core
C9	CA09	1	4 in core
C11	CA11	2	4 in core
C12	CA12	2	4 in core
C13	CA13	2	4 in core
C14	CA14	2	4 in core
C19	CA19	1	4 in core
C21	CA21	2	4 in core
C22	CA22	2	4 in core
C23	CA23	2	4 in core
C24	CA24	2	4 in core
C31	CA31	2	4 in core
C32	CA32	2	4 in core
C33	CA33	2	4 in core
C34	CA34	2	4 in core
C37	CA37	2	4 in core
C38	CA38	2	4 in core
C39	CA39	2	4 in core
C40	CA40	2	4 in core
C47	CA47	2	4 in core
C51	CA51	2	4 in core
C52	CA52	2	4 in core
C53	CA53	2	4 in core
C54	CA54	2	4 in core
Asphalt Treated Base			
C11	CT11	2	4 in core
C12	CT12	2	4 in core
C13	CT13	2	4 in core
C14	CT14	2	4 in core
C37	CT37	2	4 in core
C38	CT38	2	4 in core
C39	CT39	2	4 in core
C40	CT40	2	4 in core
C51	CT51	2	4 in core
C52	CT52	2	4 in core
C53	CT53	2	4 in core
C54	CT54	2	4 in core

Table 37. Samples to be Shipped to the
FHWA-LTPP Contractor Laboratory - SPS-1 (continued).

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Unbound Granular Base			
B16	BG09	2	*300 lb bulk sample
B17	BG10	2	*300 lb bulk sample
B18	BG11	2	*300 lb bulk sample
B16	MG09	2	Moisture Content Jar Sample
B17	MG10	2	Moisture Content Jar Sample
B18	MG11	2	Moisture Content Jar Sample
Existing Crushed Rock Base			
B13	BG06	1	*300 lb bulk sample
B14	BG07	1	*300 lb bulk sample
B15	BG08	1	*300 lb bulk sample
B13	MG06	1	Moisture Content Jar Sample
B14	MG07	1	Moisture Content Jar Sample
B15	MG08	1	Moisture Content Jar Sample
Existing Subbase			
B8	BG01	1	*300 lb bulk sample
B9	BG02	1	*300 lb bulk sample
B10	BG03	1	*300 lb bulk sample
B11	BG04	1	*300 lb bulk sample
B12	BG05	1	*300 lb bulk sample
B8	MG01	1	Moisture Content Jar Sample
B9	MG02	1	Moisture Content Jar Sample
B10	MG03	1	Moisture Content Jar Sample
B11	MG04	1	Moisture Content Jar Sample
B12	MG05	1	Moisture Content Jar Sample
Subgrade			
B2	BS02	1	*300 lb bulk sample
B3	BS03	1	*300 lb bulk sample
B4	BS04	1	*300 lb bulk sample
B5	BS05	1	*300 lb bulk sample
B6	BS06	1	*300 lb bulk sample
B7	BS07	1	*300 lb bulk sample
B2	MS02	1	Moisture Content Jar Sample
B3	MS03	1	Moisture Content Jar Sample
B4	MS04	1	Moisture Content Jar Sample
B5	MS05	1	Moisture Content Jar Sample
B6	MS06	1	Moisture Content Jar Sample
B7	MS07	1	Moisture Content Jar Sample
Embankment (Fill)			
B1	BS01	2	*300 lb bulk sample
B1	MS01	2	Moisture Content Jar Sample
NOTE: * The bulk sample shall be obtained from the participating agency.			

Table 38 - Tracking Table of Asphalt Concrete Testing
in the State Laboratory (or their designee) - SPS-1.

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C5	CA05	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C6	CA06	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C7	CA07	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C8	CA08	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C10	CA10	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C15	CA15	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C16	CA16	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C17	CA17	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C18	CA18	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C20	CA20	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C25	CA25	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C26	CA26	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C27	CA27	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C28	CA28	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C29	CA29	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C30	CA30	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C35	CA35	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C36	CA36	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C41	CA41	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C42	CA42	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C43	CA43	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C44	CA44	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C45	CA45	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C46	CA46	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C48	CA48	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C49	CA49	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C50	CA50	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C55	CA55	1	AC01/PO1	AC02/PO2			Yes	(a)	No

Table 38 - Tracking Table of Asphalt Concrete Testing
in the State Laboratory (or their designee) - SPS-1 (continued).

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C56	CA56	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C57	CA57	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C58	CA58	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C59	CA59	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C60	CA60	1	AC01/PO1	AC02/PO2			Yes	(a)	No
B25	BA01	3	See Figure 10 of reference 3.				No	(a)	Yes
B26	BA02	3	See Figure 10 of reference 3.				No	(a)	Yes
B27	BA03	3	See Figure 10 of reference 3.				No	(a)	Yes
B25	BA20	3	See Figure 10 of reference 3.				No	(a)	Yes
B26	BA21	3	See Figure 10 of reference 3.				No	(a)	Yes
B27	BA22	3	See Figure 10 of reference 3.				No	(a)	Yes
-	BC01	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes
-	BC02	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes
-	BC03	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

Table 39 - Tracking Table of Asphalt Treated Base Testing
in the State Laboratory (or their designee) - SPS-1.

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C7	CT07	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C8	CT08	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C9	CT09	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C10	CT10	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C15	CT15	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C16	CT16	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C17	CT17	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C18	CT18	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C19	CT19	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C20	CT20	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C41	CT41	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C42	CT42	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C43	CT43	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C44	CT44	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C45	CT45	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C46	CT46	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C47	CT47	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C48	CT48	2	AC01/PO1	AC02/PO2			Yes	(a)	No
C49	CT49	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C50	CT50	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C55	CT55	1	AC01/PO1	AC02/PO2			Yes	(a)	No
C56	CT56	1	AC01/PO1	AC02/PO2			Yes	(a)	No
B22	BT20	3	See Figure 10 of reference 3.				No	(a)	Yes
B23	BT21	3	See Figure 10 of reference 3.				No	(a)	Yes
B24	BT22	3	See Figure 10 of reference 3.				No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 40 - Tracking Table of Permeable Asphalt Treated Base Testing
in the State Laboratory (or their designee) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B19	BT01	3	AC04/P04	AG04/P14			No	(a)	Yes
B20	BT02	3	AC04/P04	AG04/P14			No	(a)	Yes
B21	BT03	3	AC04/P04	AG04/P14			No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 41 - Tracking Table of Unbound Granular Base Testing
in the State Laboratory (or their designee) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B16	BG09	2	UG09/P48				No	(a)	Yes
B17	BG10	2	UG09/P48				No	(a)	Yes
B18	BG11	2	UG09/P48				No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 42 - Tracking Table of Existing Crushed Rock Base Testing
in the State Laboratory (or their designee) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B13	BG06	1	UG09/P48				No	(a)	Yes
B14	BG07	1	UG09/P48				No	(a)	Yes
B15	BG08	1	UG09/P48				No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 43 - Tracking Table of Existing Subbase Testing
in the State Laboratory (or their designee) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B8	BG01	1	UG09/P48				No	(a)	Yes
B9	BG02	1	UG09/P48				No	(a)	Yes
B10	BG03	1	UG09/P48				No	(a)	Yes
B11	BG04	1	UG09/P48				No	(a)	Yes
B12	BG05	1	UG09/P48				No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes:

Table 44 - Tracking Table of Embankment Testing
in the State Laboratory (or their designee) - SPS-1.

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B1	BS01	2	UG09/P48				No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 45 - Tracking Table of Subgrade Testing in the State Laboratory
(or their designee) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B2	BS02	1	UG09/P48				No	(b)	Yes
B3	BS03	1	UG09/P48				No	(b)	Yes
B4	BS04	1	UG09/P48				No	(b)	Yes
B5	BS05	1	UG09/P48				No	(b)	Yes
B6	BS06	1	UG09/P48				No	(b)	Yes
B7	BS07	1	UG09/P48				No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 46 - Tracking Table of Asphalt Concrete Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C1	CA01	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C2	CA02	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C3	CA03	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C4	CA04	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C9	CA09	1	AC01/P01	AC02/P02	AC06/P06		No	(a)	Yes
C11	CA11	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C12	CA12	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C13	CA13	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C14	CA14	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C19	CA19	1	AC01/P01	AC02/P02	AC06/P06		No	(a)	Yes
C21	CA21	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C22	CA22	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C23	CA23	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C24	CA24	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C31	CA31	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C32	CA32	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C33	CA33	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C34	CA34	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C37	CA37	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C38	CA38	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C39	CA39	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C40	CA40	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C47	CA47	2	AC01/P01	AC02/P02	AC06/P06		No	(a)	Yes
C51	CA51	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C52	CA52	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C53	CA53	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C54	CA54	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 47 - Tracking Table of Asphalt Treated Base Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C11	CT11	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C12	CT12	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C13	CT13	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C14	CT14	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C37	CT37	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C38	CT38	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C39	CT39	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C40	CT40	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes
C51	CT51	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C52	CT52	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C53	CT53	2	AC01/P01	AC02/P02	AC07/P07	AC07/P07 (ITS)	No	(a)	Yes
C54	CT54	2	AC01/P01	AC02/P02	AC07/P07 (ITS)		No	(a)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 48 - Tracking Table of Permeable Treated Base Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
No permeable asphalt treated base testing will be conducted by the FHWA-LTPP Testing Contractor									

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 49 - Tracking Table of Unbound Granular Base Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth	Fifth	Sixth			
B16	BG09	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B17	BG10	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B18	BG11	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B16	MG09	2	UG10/P49						No	(b)	Yes
B17	MG10	2	UG10/P49						No	(b)	Yes
B18	MG11	2	UG10/P49						No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 50 - Tracking Table of Existing Crushed Rock Base Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth	Fifth	Sixth			
B13	BG06	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B14	BG07	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B15	BG08	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B13	MG06	1	UG10/P49						No	(b)	Yes
B14	MG07	1	UG10/P49						No	(b)	Yes
B15	MG08	1	UG10/P49						No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 51 - Tracking Table of Existing Subbase Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth	Fifth	Sixth			
B8	BG01	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B9	BG02	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B10	BG03	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B11	BG04	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B12	BG05	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B8	MG01	1	UG10/P49						No	(b)	Yes
B9	MG02	1	UG10/P49						No	(b)	Yes
B10	MG03	1	UG10/P49						No	(b)	Yes
B11	MG04	1	UG10/P49						No	(b)	Yes
B12	MG05	1	UG10/P49						No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 52 - Tracking Table of Embankment < 4 ft. Testing
in the FHWA-LTPP Testing Contractor Laboratory - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth	Fifth	Sixth			
B1	BS01	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B1	MS01	2	SS09/P49						No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

**Table 53 - Tracking Table of Subgrade Testing in the FHWA-LTPP
Testing Contractor Laboratory (Thin-Wall Tubes not Available) - SPS-1.**

Sample Location Number	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth	Fifth	Sixth			
B2	BS02	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B3	BS03	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B4	BS04	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B5	BS05	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B6	BS06	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B7	BS07	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
B2	MS02	1	SS09/P49						No	(b)	Yes
B3	MS03	1	SS09/P49						No	(b)	Yes
B4	MS04	1	SS09/P49						No	(b)	Yes
B5	MS05	1	SS09/P49						No	(b)	Yes
B6	MS06	1	SS09/P49						No	(b)	Yes
B7	MS07	1	SS09/P49						No	(b)	Yes

NOTE: See page 97 of reference 3 for sample storage codes.

Appendix B

Figures

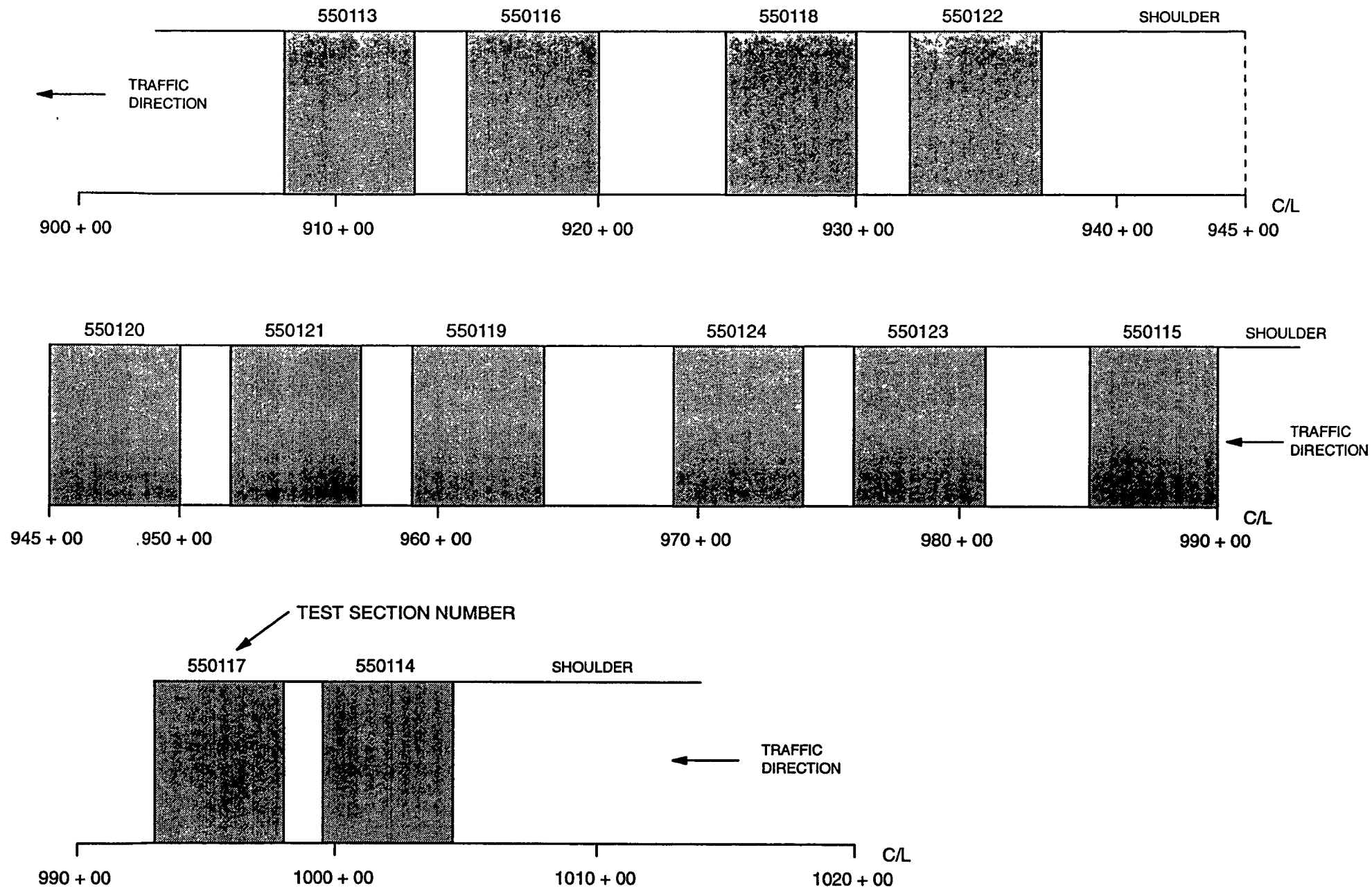


Figure 1. Layout of Test Sections.

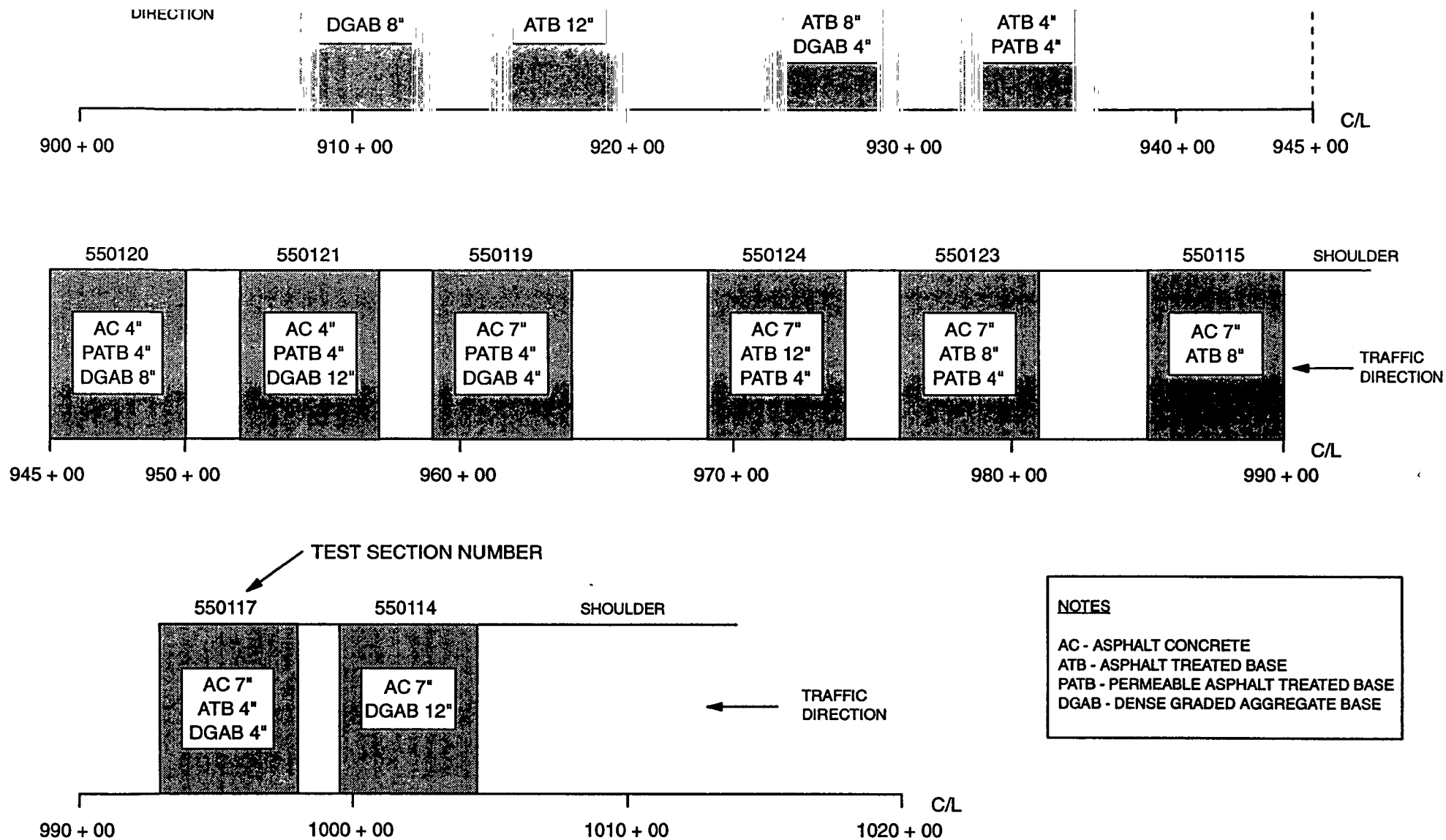


Figure 2. Design Features of Test Sections.

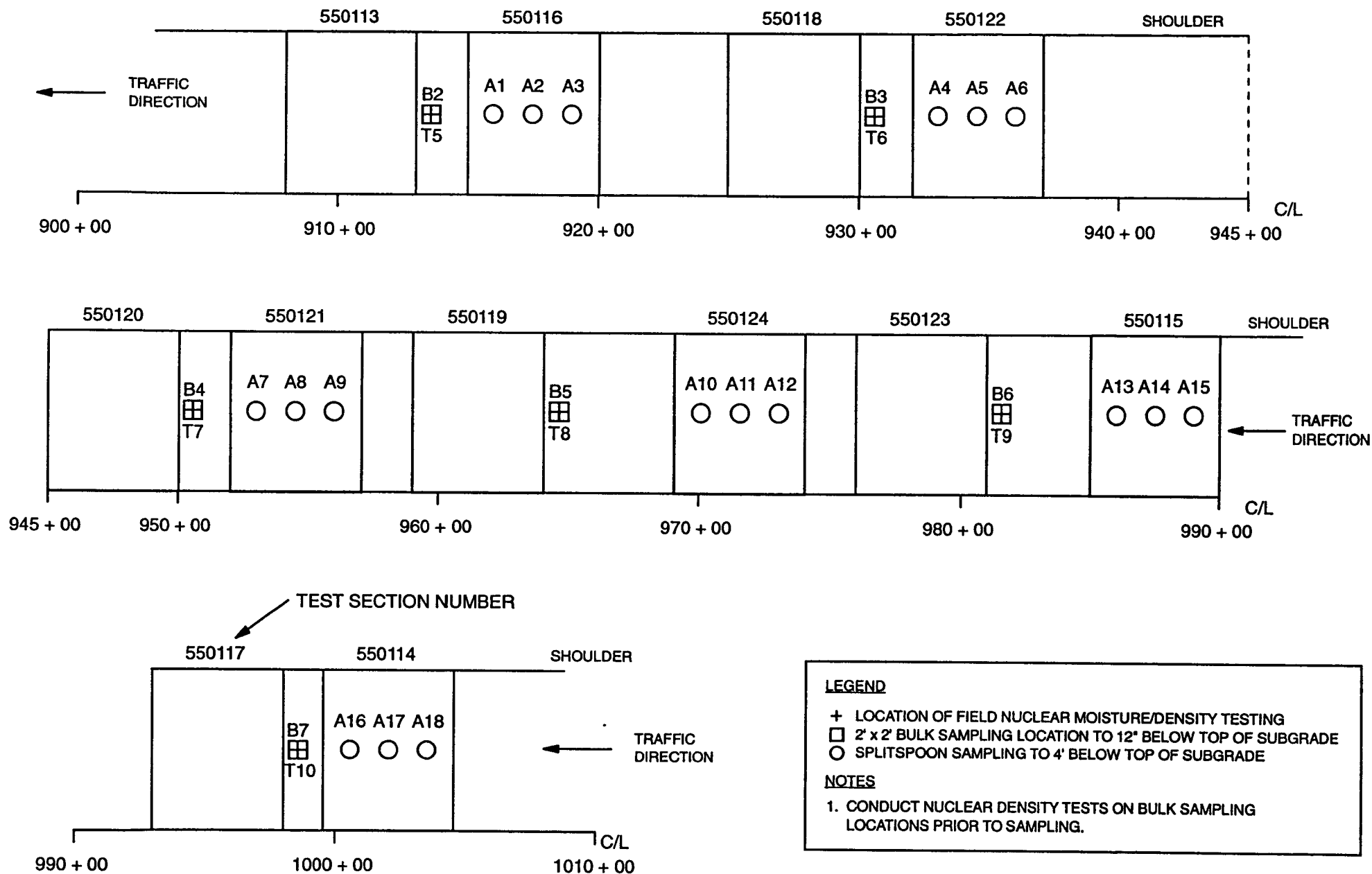


Figure 3. Overview of Sampling and Testing Plan for Subgrade.

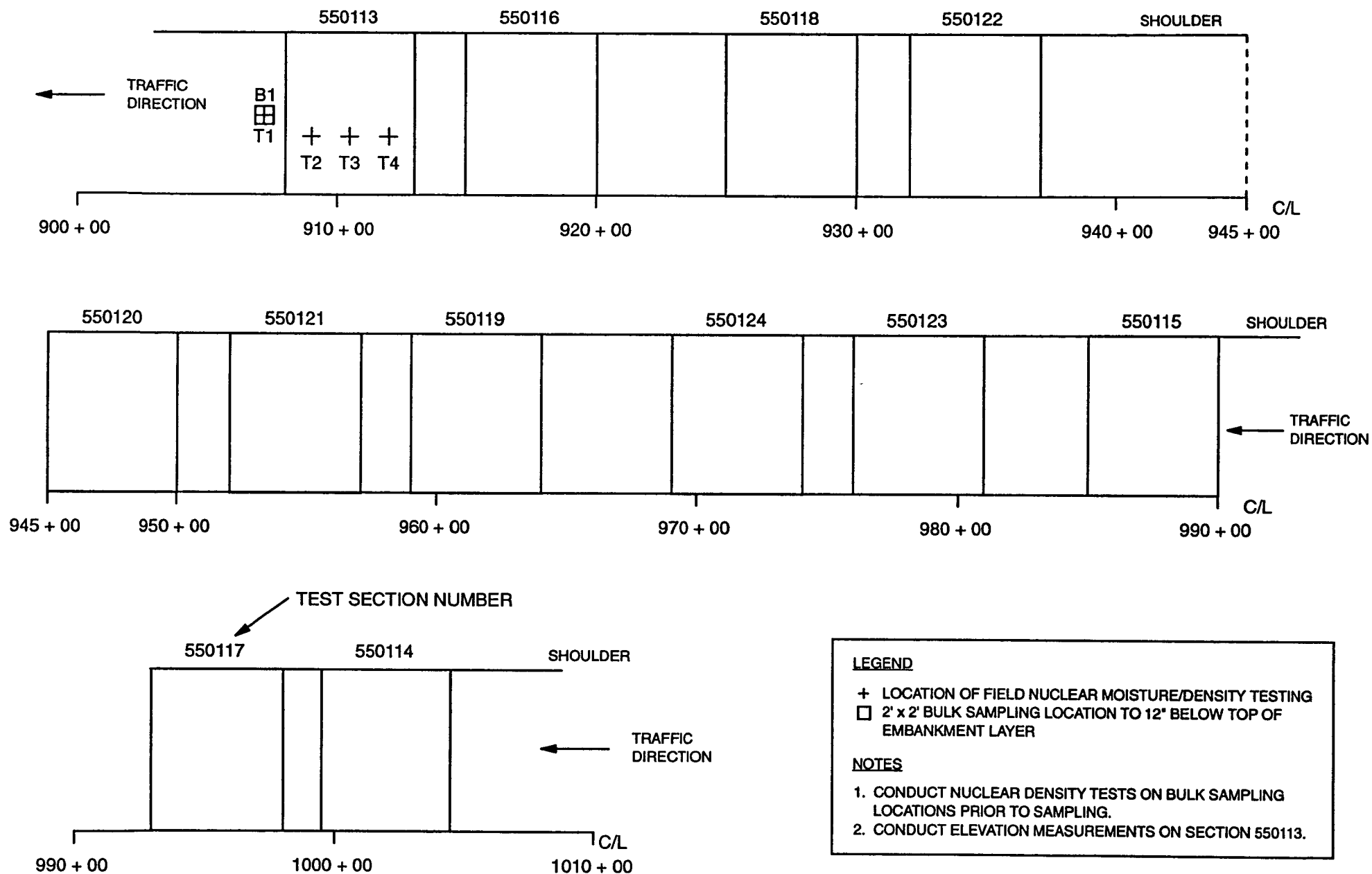


Figure 4. Overview of Sampling and Testing Plan for Embankment (Fill).

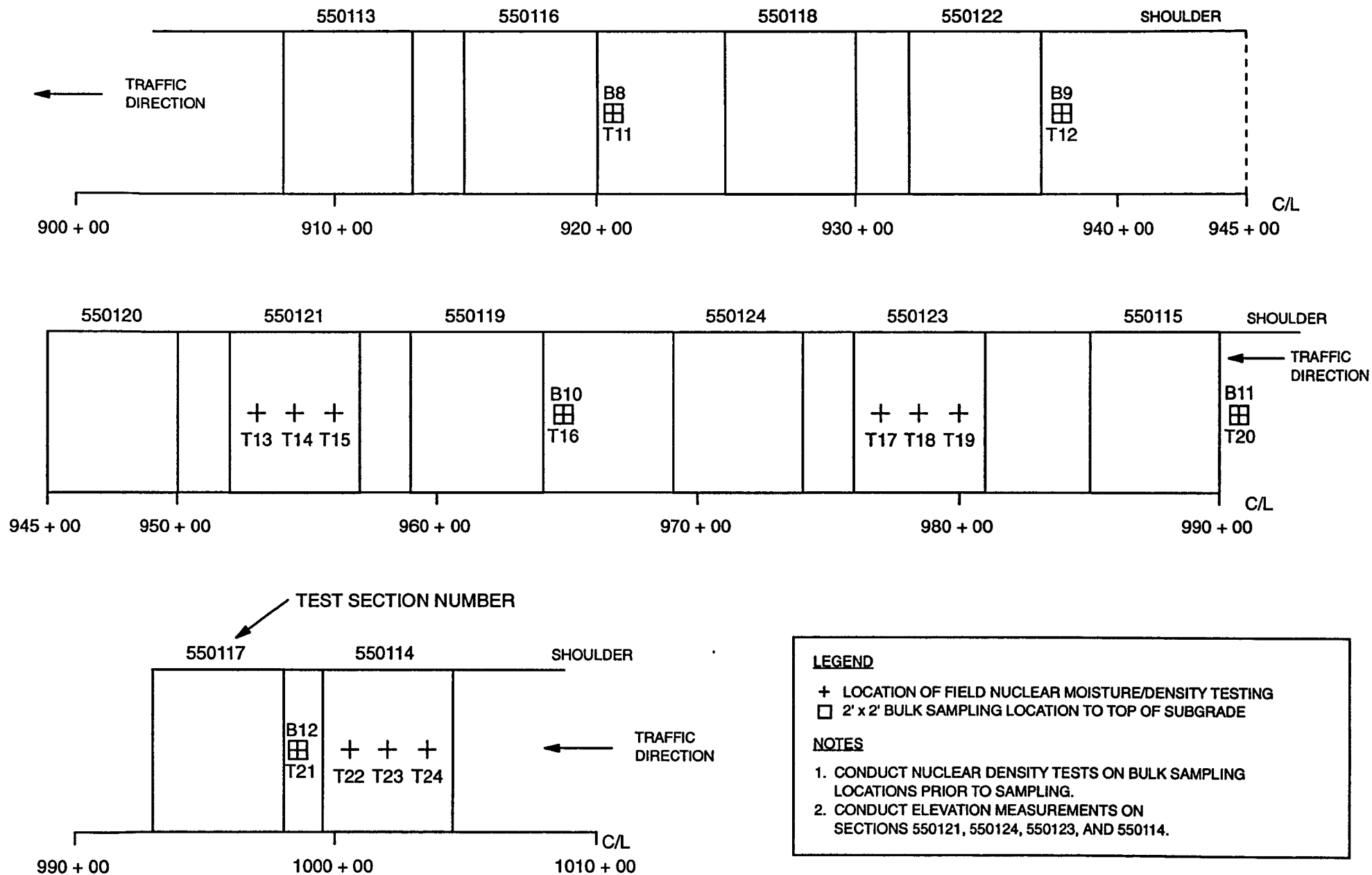


Figure 5. Overview of Sampling and Testing Plan for Existing Subbase.

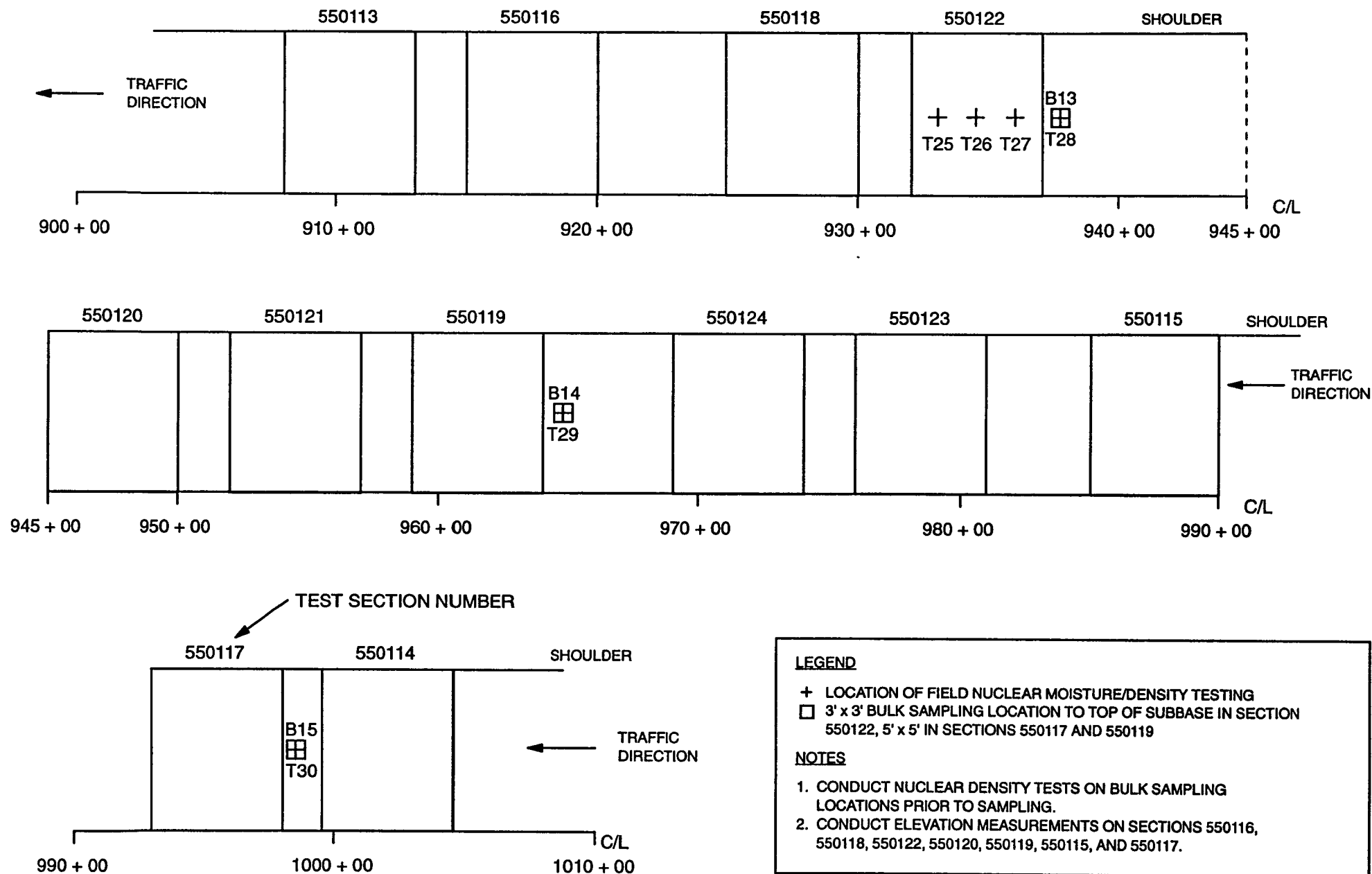


Figure 6. Overview of Sampling and Testing Plan for Existing Crushed Rock Base.

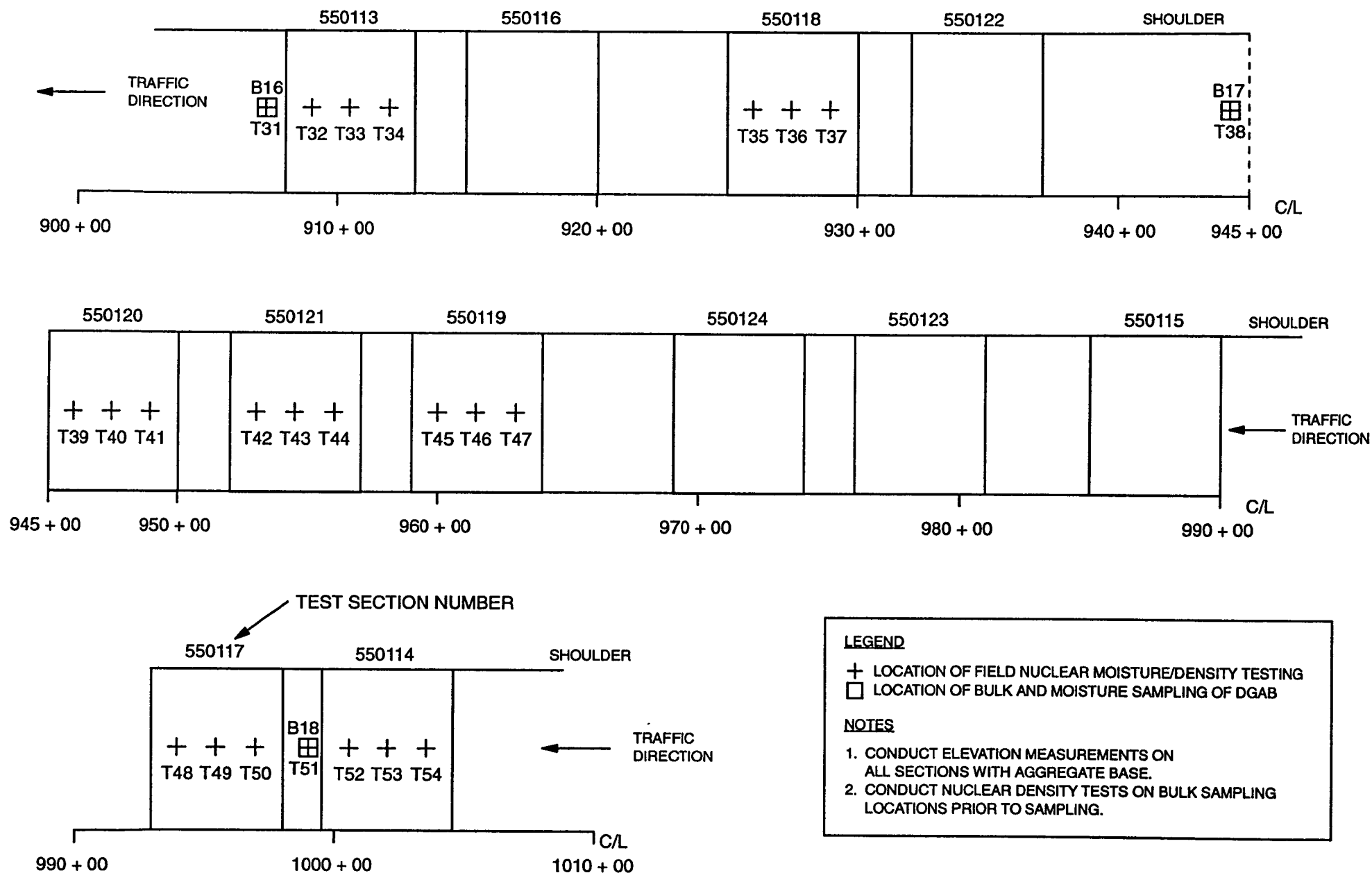


Figure 7. Overview of Sampling and Testing Plan for Aggregate Base.

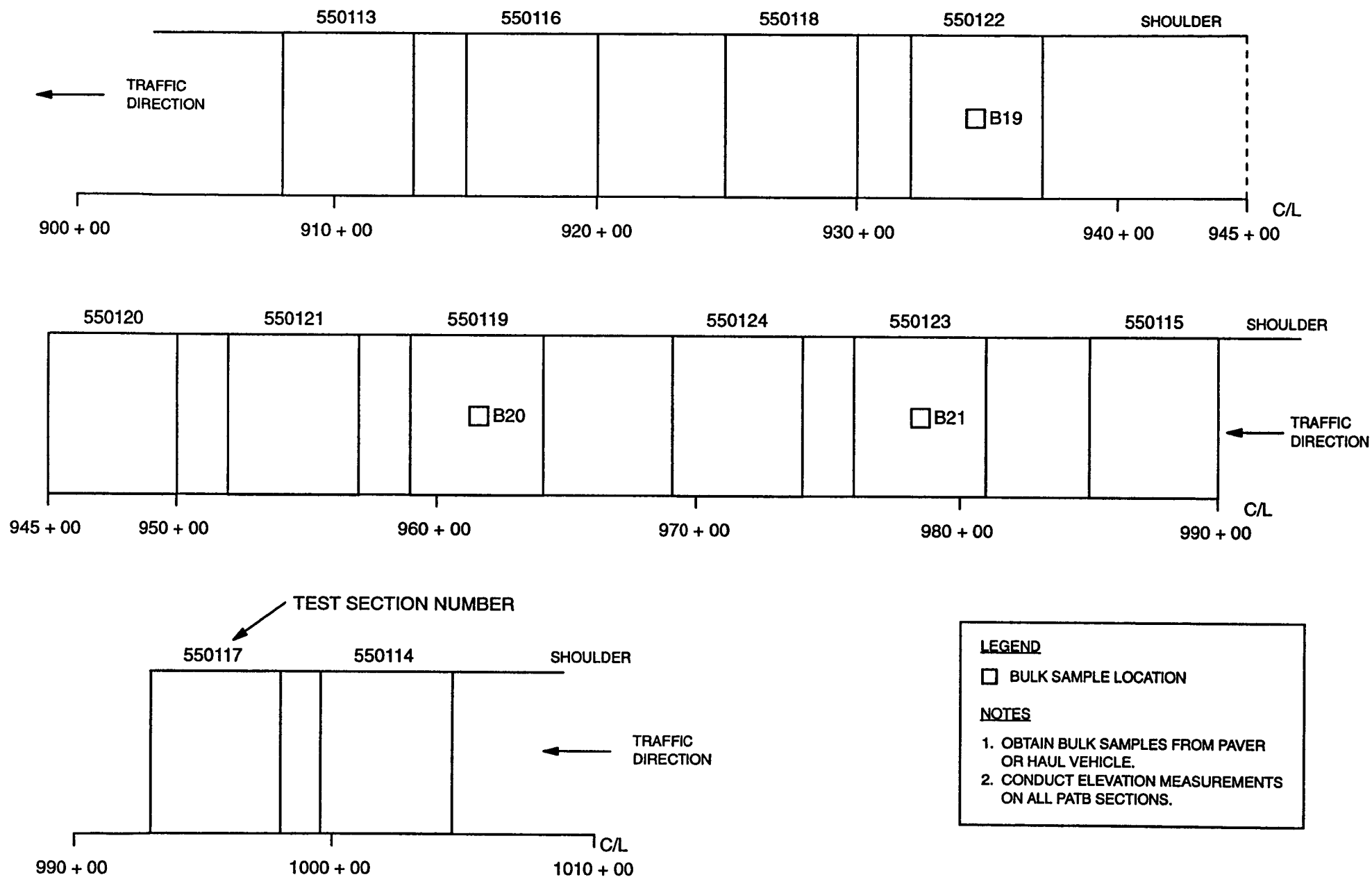


Figure 8. Overview of Sampling and Testing Plan for PATB.

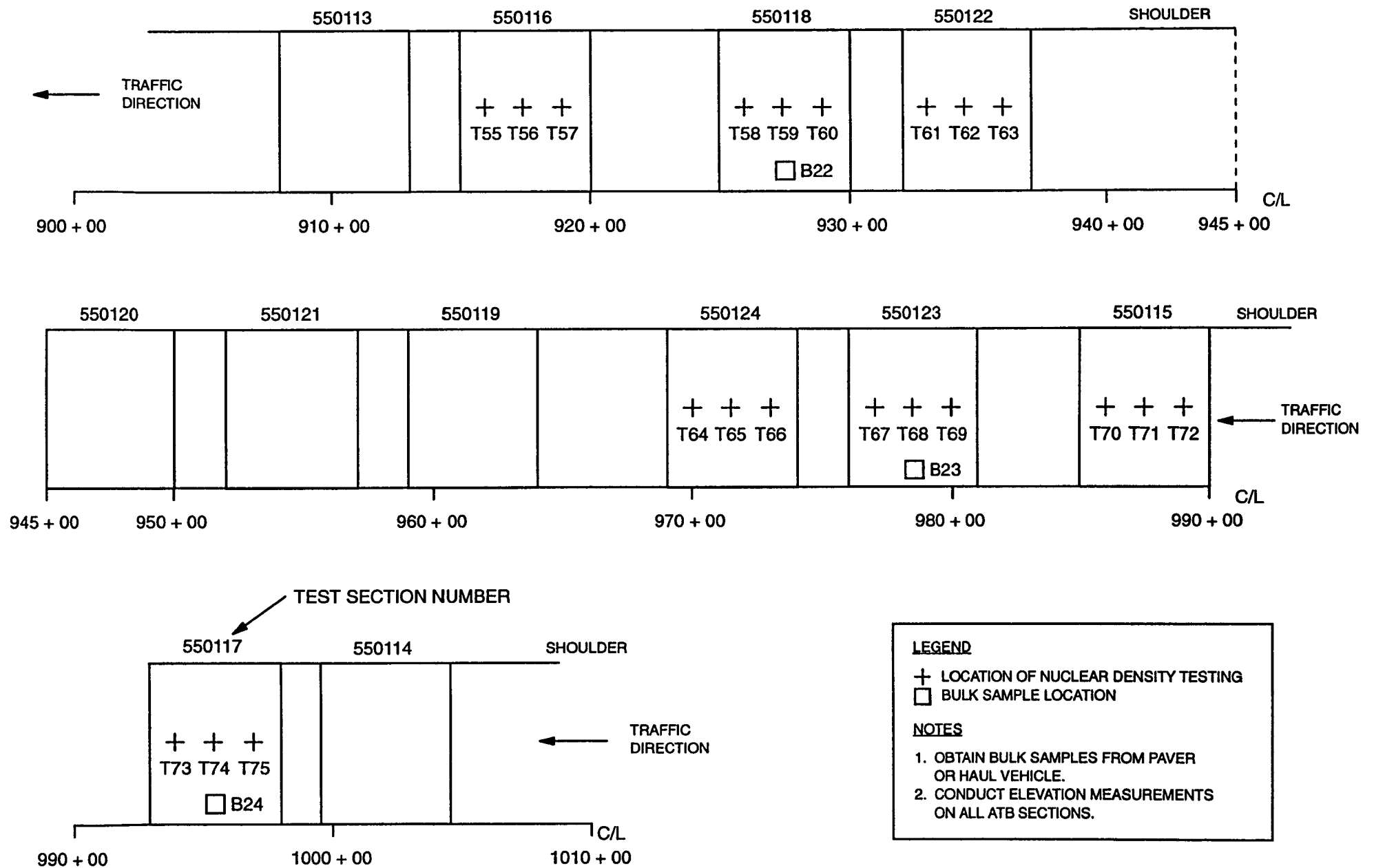


Figure 9. Overview of Sampling and Testing Plan for Asphalt Treated Base.

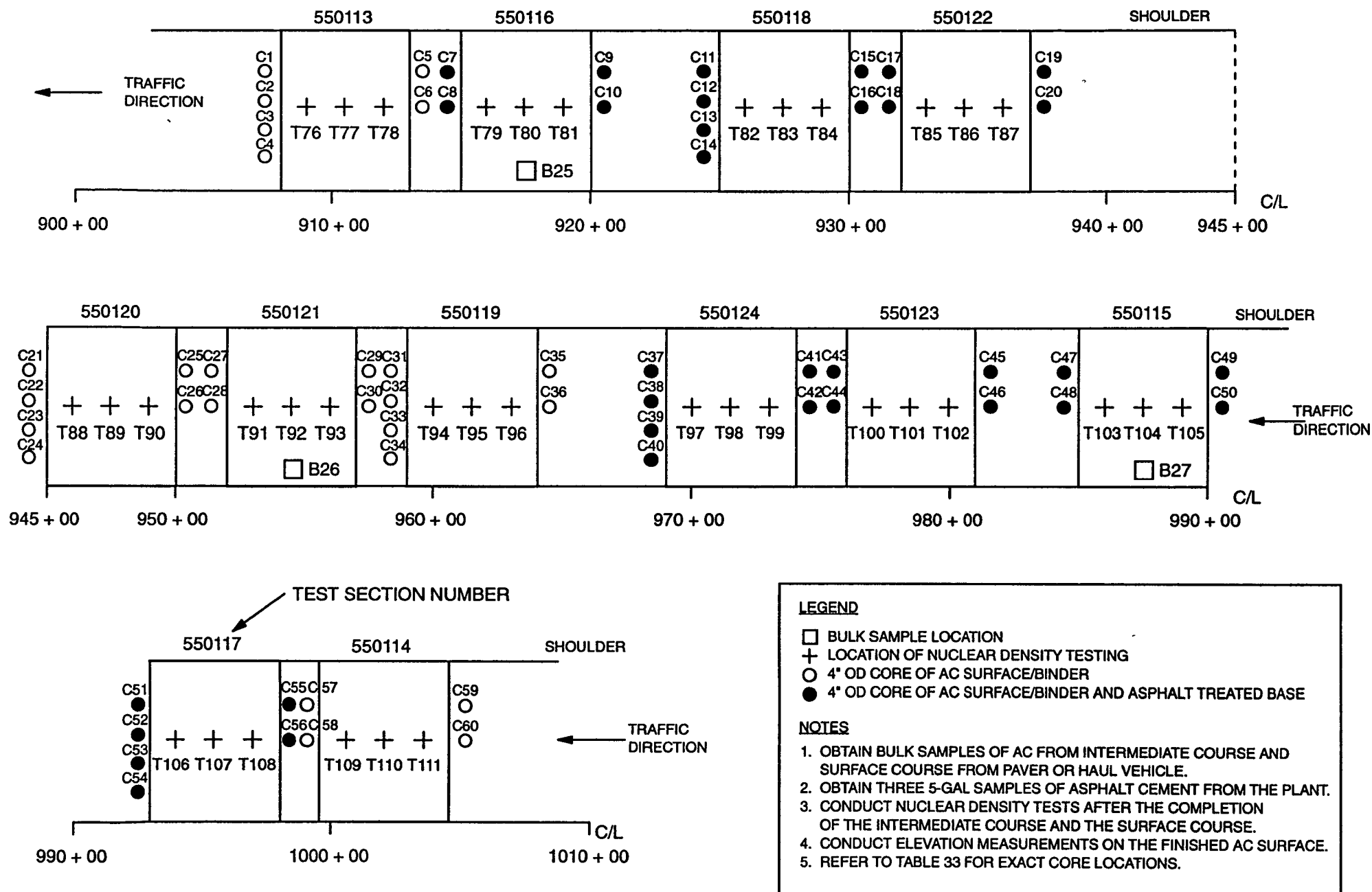
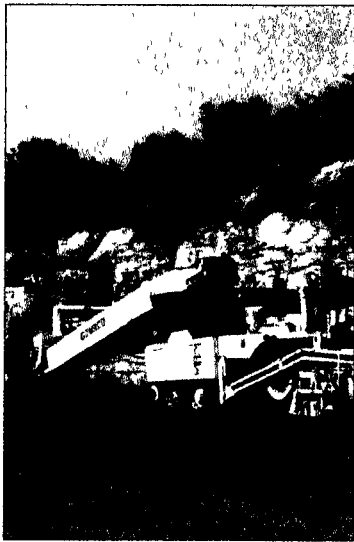


Figure 10. Overview of Sampling and Testing Plan for AC Surface.



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